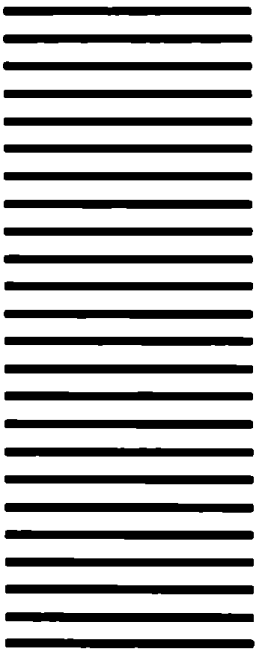
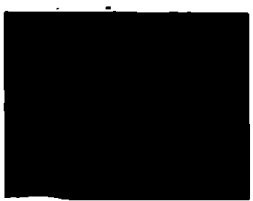
MS-DOS® 3.3

Reference Manual



EPSON®



EPSON®

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EPSON®

MS-DOS® 3.3 Reference Manual

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Introduction

Your Epson® computer comes with MS-DOS®, the disk operating system by Microsoft®. A disk operating system controls the computer's hardware and the software you are using, enabling you to create, store, and retrieve data on a diskette or hard disk.

Using MS-DOS, you can run the most powerful, sophisticated software on the market today. While running your application program, you're not even aware that MS-DOS is in the background, but it is handling all the communication between the different components of your system.

This version of MS-DOS, version 3.3, consists of the standard commands plus special menu utilities created by Epson.

Version 3.3 Enhancements

If you are familiar with version 3.2 of MS-DOS, you'll notice the following new features provided by version 3.3:

- Primary and extended MS-DOS partitions, which provide support for hard disk drives larger than 32MB (an extended DOS partition can contain multiple logical drives of up to 32MB each)
- 1.44 megabyte diskette drive support
- Expanded national language support
- New and enhanced commands.

The extended MS-DOS partition lets you use more of your hard disk's capacity. Now you can access more than the 32MB (megabyte) maximum for a partition. For example, you could access a 128MB hard disk as four 32MB disks.

With the 1.44MB drive support you can use 3½-inch, 1.44MB diskette drives with your computer.

Version 3.3 comes with five international language code pages. This means you can produce characters from a wide variety of languages, provided you have a compatible printer or monitor device.

You'll find these new commands in this version of MS-DOS:

APPEND lets you create a search path for data files (and optionally, for program files).

CALL is a batch file subcommand that calls another batch file.

CHCP and NLSFUNC are two new commands that enable code page switching.

COMP lets you compare two files or groups of files to see if they are different.

FASTOPEN speeds up access time for files on a hard disk.

GRAPH24 lets you print graphic characters on a 24-pin printer or a laser printer that supports 24-pin printing.

HDCACHE improves the efficiency of your hard disk by creating a buffer in which it stores information about the files you access.

In addition to these new commands, many of the other MS-DOS commands have been enhanced to make them more powerful and more flexible.

Epson Menu Utilities

The MENU and XTREE® utilities make it easier for you to run MS-DOS commands. Rather than typing long, complex command lines with multiple variables, you can just select the appropriate options from simple screen menus. Be sure to read Chapter 5 for information about these utilities.

How to Use This Manual

The first three chapters in this manual provide some basic information about using MS-DOS. If you have never used an operating system, these chapters will help you get started. The rest of this manual gives more detailed information about MS-DOS and its commands.

For more information, you might want to buy a book about MS-DOS, such as Van Wolverton's *Running MS-DOS*, (Bellevue, Washington: Microsoft Press, 1985).

The contents of this manual are as follows:

Chapter 1 provides some general information on using MS-DOS with your computer.

Chapter 2 describes how to manage your files and organize them in directories.

Chapter 3 provides an overview of the MS-DOS commands and the procedure for entering commands on your keyboard.

Chapter 4 is an alphabetical listing of most of the MS-DOS commands. These are the commands you use most often.

Chapter 5 describes the menu utilities: MENU, SETPRINT, and XTREE.

Chapter 6 is an alphabetical listing of the commands you can use to configure your system if you want to change the default settings.

Chapter 7 is an alphabetical listing of the MS-DOS batch processing commands you can use to create batch files. Batch files let you group commands in a single file to automate frequently used procedures.

Chapter 8 is an alphabetical listing of commands used as programming tools.

Chapter 9 describes code page switching.

Appendix A is a brief summary of all the commands described in this manual.

Appendix B lists and describes all the error messages you could possibly encounter when using MS-DOS.

Appendix C illustrates the international keyboard layouts supported by MS-DOS.

Appendix D illustrates the five code pages.

Appendix E is a list of the ANSI Escape sequences that MS-DOS uses for screen control.

Conventions Used in This Manual

This manual uses certain symbols and typographical conventions:

- All keys and function keys appear in boldface type, such as **A**, **Esc**, and **Enter**.
- When you press two keys in combination, the names appear in bold separated by a space, as in **Ctrl Z**. This means hold down the **Ctrl** key and press **Z**.
- Special symbols indicate different types of command parameters. You do not type these symbols when you enter the command; they simply describe the valid command format.

  `[ ]` Square brackets indicate an optional entry.

  Ellipses indicate that you may repeat a parameter as many times as needed or desired.

- Lowercase italic letters indicate a command parameter that varies:

  ```
  TYPE d:filename
  ```

  In the above command format, *d* and *filename* are parameters that vary. You can use any disk drive descriptor and any filename when entering this command. An example of this command is the following:

  ```
  TYPE A:AUTOEXEC.BAT
  ```

- When instructions are given to type a command, the command appears in uppercase letters like this: DISKCOPY, CHDIR, or MENU. However, it is not necessary to type the command in uppercase letters. You can type the command in uppercase or lowercase letters.

Where to Get Help

Customer support and service for Epson products is provided by a network of authorized Epson dealers and service centers throughout the United States. Epson America, Inc. provides product information and toll-free support to our dealers and service centers.

Therefore, we ask that you contact the business where you purchased your Epson product to request assistance. If they do not have the answer to your question, they can obtain it through our toll-free dealer support program.

We are confident that this policy will provide you with the assistance you need. If you need to find an Epson dealer or service center in your area, please call our toll-free number: 1-800-922-8911.

Chapter 1

MS-DOS and Your Computer

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Loading MS-DOS

To use your computer, you must load MS-DOS and have it running in the computer's memory. Loading MS-DOS, also known as booting the system, lets you give instructions to the operating system in the form of MS-DOS commands.

Follow these steps to load MS-DOS:

1. Turn on your computer and monitor.
2. Place the MS-DOS startup diskette into drive A and secure the drive. (See your User's Guide for a complete description of turning on your system and inserting diskettes.)

   Your computer begins loading MS-DOS into memory. After some preliminary copyright information appears on the screen, the date prompt appears, as in this example:

   ```
   Current date is Wed  3-15-1988
   Enter new date (mm-dd-yy):_
   ```

   You can either accept the date shown or enter a new date.
3. Press **Enter** to accept the current date. The time prompt appears:

   ```
   Current time is Ø8:15:1Ø.Ø
   Enter new time:_
   ```

   You can either accept the time shown or enter a new time.
4. Press **Enter** to accept the time shown.

Note

If your computer does not have a real-time clock, you need to enter the date and time each time you load MS-DOS. For a complete description of how to enter the date and time, see the DATE and TIME commands in Chapter 4.

Now you see the MS-DOS command prompt, `A)`. This is your starting point.

Safeguard your original MS-DOS diskettes by making backup copies. Store the originals in a safe place and keep the second set as your working copies for daily use. Follow the instructions below.

Backing Up Your System Diskettes

This section describes how to use the MS-DOS command DISKCOPY to copy (back up) your MS-DOS diskettes. If you have not done this yet, follow the instructions below.

Note

You can copy diskettes using the simplified Epson menu utility, MENU. See the description of MENU in Chapter 5 for instructions.

The procedure for copying a diskette depends on whether your computer has two diskette drives or only one diskette drive. Follow the procedure for your model, described below. You need blank diskettes that are the same type as your MS-DOS system diskettes. (See your User's Guide if you are not sure of the diskette type.) The DISKCOPY program automatically formats a diskette if it is not already formatted.

When you finish making the copies, be sure to put the originals in a safe place.

Copying with two diskette drives

1. First make sure your original diskette is write-protected. A 5¼-inch diskette is write-protected if there is an adhesive tab over the write-protect notch. A 3½-inch diskette is write-protected when the switch is set to the write-protect position. See your User's Guide for more information.
2. Insert your MS-DOS operating diskette (the one that contains DISKCOPY) in drive A. The A> prompt should be on the screen.
3. Insert a blank diskette in drive B.

4. Type:

   ```
   DISKCOPY A: B:
   ```

   and press **Enter**. The screen displays these prompts:

   ```
   Insert SOURCE diskette in drive A:
   Insert TARGET diskette in drive B:
   Press any key when ready . . .
   ```

5. Drive A already contains the diskette you want to copy (the source) and drive B contains the blank diskette (the target), so just press any key. If the diskette in drive B is not formatted, the DISKCOPY program formats it and then begins copying the data from drive A to the formatted diskette in drive B.

6. When the copy is complete, the screen displays this prompt:

   ```
   Copy another diskette (Y/N)?
   ```

   Press **Y** so you can make a copy of the next diskette. Remove the diskettes from drives A and B. Then insert the next system diskette in drive A and another blank diskette in drive B. Follow the prompts on the screen to copy this diskette and any other system diskettes.

7. When you finish and the `Copy another diskette (Y/N)?` prompt appears, press **N** to return to the MS-DOS `A>` prompt.

Copying with one diskette drive

1. First make sure your original diskette is write-protected. A 5¼-inch diskette is write-protected if there is an adhesive tab over the write-protect notch. A 3½-inch diskette is write-protected when the switch is set to the write-protect position. See your User's Guide for more information.

2. Insert your MS-DOS operating diskette (the one that contains the DISKCOPY program) in drive A. The `A>` prompt should be on the screen.

3. Type:

   ```
   DISKCOPY
   ```

   and press **Enter**. The screen displays the following prompts:

   ```
   Insert SOURCE diskette in drive A:
   Press any key when ready . . .
   ```

4. Drive A already contains the diskette you want to copy (the source), so just press any key. The DISKCOPY program copies the contents of the diskette to the computer's memory. Then the screen displays these prompts:

   ```
   Insert TARGET diskette in drive A:
   Press any key when ready . . .
   ```

5. Remove the MS-DOS startup diskette from drive A and insert the blank diskette (the target) in the drive. Then press any key.

   If the diskette in drive A is not formatted, the DISKCOPY program formats it and then begins copying the data from the computer's memory to the formatted diskette.

Note

If the MS-DOS diskette holds more data than can fit in the computer's 640KB of memory, the computer needs to copy the contents of the diskette in two passes. The screen prompts you when to insert and remove the diskettes.

   When the copy is complete, you see this prompt:

   ```
   Copy another diskette (Y/N)?
   ```

6. Press **Y** so you can make a copy of the next system diskette. Follow the instructions above and the prompts on the screen to copy this diskette and any other system diskettes. When you finish and the `Copy another diskette (Y/N)?` prompt appears, press **N** to return to the MS-DOS `A)` prompt.

Be sure to label all your copies. Call one set MS-DOS Working Diskettes and the other MS-DOS Master Diskettes. Date the labels and attach them carefully to the top of each diskette. To avoid damaging 5¼-inch diskettes, it is best not to write on a label once it is on the diskette. If you must, use a soft-tip pen.

Store your master diskettes in a separate, safe place.

Changing the Default Drive

As you already know, the symbol `A>` is the MS-DOS prompt from the command processor. When you see the `A>` prompt, you know that MS-DOS is operating from drive A and you can now enter a command.

Whenever you turn on or reset your computer, MS-DOS automatically logs onto drive A and displays the `A>` prompt.

Note
If your computer has a hard disk that has been set up to boot the system automatically, MS-DOS displays the command prompt as `C>`.

If you want to run a program or find a file on a different drive, you must specify that drive. One way to do this is to log onto the drive. As an example, log onto drive B now. At the `A>` prompt, type `B:` and press **Enter**.

Your screen displays the `B>` prompt. This means that MS-DOS is now using drive B as the default drive. The system continues to read from drive B until you log onto another drive or turn off or reset your computer.

You don't have to log onto a drive to run a program or find a file on that drive. You can just type the drive descriptor before the program name or file name. For example, if you want to run the CHKDSK program while logged onto drive B, type the following and press **Enter**:

```
A:CHKDSK
```

The CHKDSK program displays information on the screen. You are using a program from drive A even though you are still logged onto drive B.

Resetting the Computer

When you are running MS-DOS, you may need or want to reset your computer. This is sometimes necessary if you are using a program that gets stuck in the middle of an operation. Or you may want to reset to start fresh.

You can perform three types, or levels, of resets. As you move from one level to the next, you cause more of the system to halt and start over. The three levels are: the MS-DOS BREAK, the operating system reboot, and the hardware level restart.

The first level, the MS-DOS BREAK, merely stops a program's operation and returns you to the command prompt. Any program you are running is stopped, and any data not stored on disk is lost. You can usually use the following command to interrupt an application program: hold down the **Ctrl** key and press **C**. However, many application programs have their own abort commands which you must know when using those programs.

The next level is the operating system reboot. This stops the computer's CPU (central processing unit) and forces you to reload MS-DOS and start over. Any program you are running is stopped, and any data not stored on disk is lost. After MS-DOS reloads, the date and time prompts appear followed by the command prompt. To reset at this level, hold down the **Ctrl** and **Alt** keys and then press the **Del** key.

The final level is a hardware level restart. To do this, press the **RESET** button. It works the same as turning your computer's power switch OFF then ON again. Use this when no other reset can help with a software problem.

Using Diskette Drives

Your computer has one or more of the following types of drives:

- 360KB drive—With this drive, use 5¼-inch, double-sided, double-density, 360KB diskettes. (You can also use single-sided, 160KB or 180KB diskettes.) These diskettes contain 40 tracks per side, 8 or 9 sectors per track, and hold up to 360KB of information. (With 8 sectors per track, a diskette holds 320KB.) KB stands for kilobyte; each kilobyte equals 1024 bytes.
- 1.2MB drive—With this drive, use 5¼-inch, double-sided, high-density, 1.2MB diskettes. These diskettes contain 80 tracks per side, 15 sectors per track, and hold up to 1.2MB of information. MB stands for megabyte; each megabyte equals 1,048,576 bytes.
- 720KB drive—With this drive, use 3½-inch, double-sided, double-density, 720KB diskettes. These diskettes contain 80 tracks per side, 9 sectors per track, and hold up to 720KB of information.
- 1.44MB drive—With this drive, use 3½-inch, double-sided, high-density, 1.44MB diskettes. These diskettes contain 80 tracks per side, 18 sectors per track, and hold up to 1.44MB of information.

If your computer has more than one of these drive types, you need to be aware of certain incompatibilities between the drives and the diskettes they use. These incompatibilities also apply to the same type of diskette drives on other compatible computers.

Drive and diskette incompatibilities

Because of the difference in size, you cannot use 3½-inch diskettes in a 5¼-inch drive or vice versa. Additionally, there are certain limitations on using diskettes that are the same size as the drive but have different capacities. Tables 1-1 and 1-2 summarize the possibilities and limitations.

Table 1-1. 5¼-inch drive/diskette compatibility

Drive type	Diskette types it can read from and write to
360KB	160KB, 180KB, 320KB, or 360KB
1.2MB	160KB, 180KB, 320KB, or 360KB, and 1.2MB

Warning
If you write to a 360KB (or 160KB, 180KB, or 320KB) diskette while it is in a 1.2MB drive, you may not be able to read it or write to it in a 360KB drive later.

Table 1-2. 3½-inch drive/diskette compatibility

Drive type	Diskette types it can read from and write to
720KB	720KB
1.44MB	720KB, 1.44MB

If you have any combination of the above drives (360KB, 1.2MB, 720KB, and 1.44MB), you can copy files from one drive to another (using the COPY command) as long as the correct diskette type is in each drive. You can also copy files between a hard disk and any type of diskette. You cannot use the DISKCOPY command to copy from one drive to another if the two drives are not the same type.

Using two diskette drives

Operating systems usually expect the computer to have at least two physical disk drives. Normally, MS-DOS recognizes drives A and B for two diskette drives, and C for the hard disk drive.

A typical way to use a two-drive system is to load MS-DOS from drive A, run your application software from the same drive, and use drive B to store your data files.

Note
You can load MS-DOS from an application software diskette if that diskette contains the operating sytem files including COMMAND.COM. See Chapter 4 for information on the /S parameter of the FORMAT command and the SYS command. You use these commands to transfer the necessary system files to a diskette.

There are many advantages to having two drives. You can perform file copy operations without swapping disks. This saves a great deal of time and reduces the risk of damaging your data by accidentally inserting the wrong disk for a copy or format operation. While you have an application program in one drive, you can log onto the other drive to access a file, perform disk operations, or display a directory.

Using a single diskette drive

If your system has only one diskette drive, you enter commands just as you would for a system with two diskette drives. The only difference is that all your diskette operations are performed on drive A.

For certain functions, such as copying diskettes, your single drive can act as two drives, drive A and drive B. Instead of A and B representing two physical drives, they represent two different diskettes in the same drive.

When you specify a file on a drive other than A, MS-DOS prompts you to insert the diskette for that drive. If you type `COPY LETTER B:` and press **Enter**, MS-DOS copies the file from the A diskette to the computer's memory and then the screen displays the following:

```
Insert diskette for drive B:
and strike any key when ready
```

Whenever you need to change diskettes, this prompt reminds you which diskette to use. You simply remove your A diskette from the drive, insert your B diskette, and press any key to continue. MS-DOS copies the file from memory to the B diskette in the drive.

MS-DOS displays the letter of the default drive in the command prompt, not the letter of the last diskette you used. For example, if you just viewed the directory of the B diskette and your default drive is A, MS-DOS knows that the B diskette is still in the drive even though the command prompt is `A>`. If you now type `DIR` to view the directory of the A diskette, MS-DOS prompts you to:

```
Insert diskette for drive A:
and strike any key when ready
```

Formatting Diskettes

Before you can store data on a new diskette, the diskette must be formatted. Formatting prepares the diskette so that MS-DOS can write to it. You need to do this only once, before you use the diskette for the first time.

You can also reformat previously used diskettes. Reformatting, however, erases all data on that diskette. Always be sure that you do not want to save any of the data on a used diskette before you format it.

The formatting procedure you use depends on the configuration of your system, either two diskette drives or one diskette drive.

Follow the instructions below for your configuration.

Formatting with two drives

Follow this procedure to format a diskette in drive B. (If you want to format a diskette in a different drive, substitute the letter for that drive in the instructions below.)

1. Insert your working copy of the MS-DOS diskette that contains the FORMAT program in drive A (and press any key if necessary) or log onto drive C (and the appropriate directory) if you have stored the FORMAT program on the hard disk.

2. When you see the `A>` or `C>` prompt, type:

   ```
   FORMAT B:
   ```

   and press **Enter**. You see this prompt:

   ```
   Insert new diskette for drive B:
   and strike ENTER when ready
   ```

3. Insert the diskette you want to format into drive B, and press **Enter** to start formatting. MS-DOS displays the head and cylinder numbers as it formats each cylinder of the diskette.

4. When the diskette is completely formatted, you see messages such as these (for a 360KB diskette):

```
Format complete
 362496 bytes total disk space
 362496 bytes available on disk
Format another (Y/N)?
```

5. You can either press **Y** and **Enter** to format another diskette, or press **N** and **Enter** to return to the MS-DOS command prompt.

Formatting with one drive

1. Insert your working copy of the MS-DOS diskette that contains the FORMAT program in drive A (and press any key if necessary) or log onto drive C (and the appropriate directory) if you have stored the FORMAT program on the hard disk.

2. When you see the `A>` or `C>` prompt, type:

```
FORMAT A:
```

   and press **Enter**. You see this prompt:

```
Insert new diskette for drive A:
and strike ENTER when ready
```

3. If the MS-DOS diskette is in drive A, remove it. Then insert the diskette you want to format in drive A and press **Enter** to start formatting. MS-DOS displays the head and cylinder numbers as it formats each cylinder of the diskette.

4. When the diskette is completely formatted, you see messages such as these (for a 360KB diskette):

```
Format complete
 362496 bytes total disk space
 362496 bytes available on disk
Format another (Y/N)?
```

5. You can either format another diskette by pressing **Y** and **Enter** or return to the MS-DOS system prompt by pressing **N** and **Enter**.

Using the Keyboard With MS-DOS

This section describes how to use the keyboard to take advantage of a variety of MS-DOS functions. (See your User's Guide for a detailed description of the keyboard.)

Control key functions

The control key (**Ctrl**) performs a variety of functions when used with other keys. To activate these functions, you hold down the **Ctrl** key and then press the other key or keys. This manual shows these multiple key commands like this:

Ctrl C

Table 1-3 shows the control key functions available in MS-DOS.

Table 1-3. Control key functions

Control key combination	Function
Ctrl C	Aborts the current command.
Ctrl H	Removes the last character from the command line and erases the character from the screen; same as pressing the backspace key.
Ctrl I	Inserts a tab in the command line; same as pressing the tab key.
Ctrl J	Inserts an end-of-line without emptying the command line; this allows you to enter a command on more than one line.
Ctrl M	Same as **Enter**.
Ctrl P	Echoes keyboard output to the printer; press **Ctrl P** again to turn off the echo.
Ctrl S	Pauses scrolling of the output display on the screen; press any key to resume.
Ctrl Z	Places an end-of-file character in a text file.
Ctrl Break	Halts command execution; same as **Ctrl C**.
Ctrl Alt Del	Performs a system reset; any data in memory is lost.

Function keys

The function keys, F1 through F6, serve as command line editing keys in MS-DOS. When you type a command on the command line and press **Enter**, the command executes and the characters in the command line automatically go to a buffer that acts as a temporary storage area. The function keys enable you to retrieve the characters stored in the buffer to do the following:

- Instantly repeat a command line by pressing a single key.
- Edit the command and retry it without retyping the entire command.
- Create a command line that is similar to the previous command line with a minimum of typing.

The following example shows how you can use the MS-DOS function keys to edit a command line:

1. Type `DIR PROG.COM` and press **Enter**. MS-DOS displays information about the file PROG.COM on your screen ("File not found," for example) and saves the command line to the buffer.
2. Press **F3** to copy the contents of the buffer to the command line.
3. Press **Enter** to send the command line to MS-DOS for execution.
4. Press **F2** and **C** to display the characters in the buffer up to but not including the letter C. The command line displays the following:

   ```
   DIR PROG._
   ```

5. Type TXT and press **Enter** to display information about a file named PROG.TXT. The command line DIR PROG.TXT is now in the buffer.
6. Type TYPE, press **Insert** and a space, and then press **F3** and **Enter** to display the contents of PROG.TXT.

The command line TYPE PROG.TXT is now in the buffer.

When you are typing, the characters enter directly into the command line, overwriting the characters in the buffer. When you press **Insert**, as in the above example, you can insert characters into the buffer without overwriting characters.

If you had misspelled TYPE as BYTE, you would see:

```
BYTE PROG.TXT
```

Because this is not an acceptable command, you would receive an error message. Correct the command in either of two ways:

- Press the following keys, one after the other:

  T, F1, P, F3

  The **T** replaces the B, **F1** copies the Y, the **P** replaces the T, and **F3** copies the rest of the command line.

- Press the following keys, one after the other:

  Delete, Delete, F1, Insert, Y, P, F3

  Pressing **Delete** twice removes the first and second characters in the buffer. **F1** displays the third character in the buffer. **Insert**, **Y**, and **P** insert the two characters, and **F3** displays the rest of the buffer characters.

Either method produces the following command line:

```
TYPE PROG.TXT
```

Generating special characters

MS-DOS uses 256 characters, each of which is assigned a unique code. You can generate special characters that do not appear on the keyboard using the keys on the numeric keypad with the **Alt** key. To do this, hold down **Alt** and enter the decimal value of the character code for the desired character. The special characters and their character codes are shown in Appendix D.

Note
Remember, you must generate these characters from the numeric keypad. You cannot use the numbers on the top row of the standard keyboard. You cannot display characters in the range from 0 to 31.

When you release **Alt**, the specified character is displayed at the current cursor position. For example, to print the ½ character, which is code 171, hold down **Alt** and type 171. When you release **Alt**, ½ appears.

When you are in graphics mode, you can display the characters from 128 to 255 only after loading the MS-DOS GRAFTABL character generator. See Chapter 4 for information on the GRAFTABL command.

Selecting international keyboards

MS-DOS allows you to select an international keyboard layout for your system using the KEYB command:

Country/language	Keyboard code	KEYB command
Australia	US	KEYB US
Belgium	BE	KEYB BE
Canada (English)	US	KEYB US
Canada (French)	CF	KEYB CF
Denmark	DK	KEYB DK
Finland	SU	KEYB SU
France	FR	KEYB FR
Germany	GR	KEYB GR
Italy	IT	KEYB IT
Latin America	LA	KEYB LA
Netherlands	NL	KEYB NL
Norway	NO	KEYB NO
Portugal	PO	KEYB PO
Spain	SP	KEYB SP
Sweden	SV	KEYB SV
Switzerland (French)	SF	KEYB SF
Switzerland (German)	SG	KEYB SG
United Kingdom	UK	KEYB UK
United States	US	KEYB US

See the KEYB command in Chapter 4 for more information.

After you select one of these special keyboard commands, use the appropriate international keyboard type to generate the characters appearing on the keys. Appendix C includes illustrations of these keyboards and complete details.

Chapter 2

Managing Files and Directories

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Creating and Using Directories 2-6
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- Changing directories 2-8
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Managing Files

You store all your work and programs in files. Usually, you create these files with the application programs you are using with your computer. This section explains how to name, maintain, and protect your files.

Naming files

Each file must have a filename. A filename consists of up to eight characters, identifying the information stored in the file. Although it is not essential, you can add up to a three-character extension to further identify the file. (In this manual, the word *filename* represents the name of a file whether or not it has an extension.)

When you use an extension, you must separate it from the filename by a period. For example, a typical word processing filename looks like this:

```
LETTER.DOC
```

Application programs often determine the extensions for the files you create. For example, if you store a file called TEXT, a program might make a backup copy of that file automatically for you and call it TEXT.BAK or TEXT.DOC. Avoid giving names and extensions used by your application software.

It is best not to use the following filename extensions because MS-DOS uses them:

BAT, BIN, COM, CRF, EXE, LST, MAP, OBJ, SYS

When you name a file, you can use any combination of letters and numbers. But do not use uppercase and lowercase letters to distinguish between files. MS-DOS does not recognize a difference and always displays filenames in uppercase.

Also, do not use a space or any of the following symbols in your filename:

```
. " / \ { } : ¦ ( ) + = ; , ? *
```

Develop a logical method for naming your files to make your data easy to find. For example:

REPORT.TXT	A text file containing a report
MEMO321	A memo written on March 21
2003.INV	Your invoice number 2003

Device names—Certain names are reserved by MS-DOS and used as *device names*. Do not use device names for your filenames. MS-DOS recognizes the following device names:

- AUX (Auxiliary) is the serial port.
- CON (Console) is the keyboard and monitor.
- PRN (Printer) is your daisywheel or dot-matrix printer.
- NUL (Null) is a non-functional device for testing without real output or input. When you use NUL to test output, all data is sent to the null device, but it is not acted upon. For input, an immediate end-of-file code is sent.
- LPT1 (Line Printer 1) is your printer (the same as PRN).
- COM1 (Communication Port 1) is your serial port (the same as AUX).

LPT2, LPT3, and COM2, COM3, and COM4 are device names for additional printers and serial ports. Your system can recognize these devices, but cannot use them unless they are actually installed.

Using a disk drive descriptor—In addition to the name and extension, you can include a disk drive descriptor in your filename. A disk drive descriptor tells MS-DOS to look for the file on the disk in the drive you specify. If you do not include a drive descriptor, MS-DOS looks for the file on the default drive.

If the file you want is not on the default drive, type the letter of the drive and a colon before the filename:

```
B:NEWFILE.EXT
```

Using wildcards to group files—You can use two special characters called wildcards when referring to your files. A question mark (?) can take the place of any single character and an asterisk (*) can replace any group of characters, even the entire filename or extension.

Using these wildcards allows you to refer to a group of related files such as all the files with .TXT extensions. This enables you to execute a command affecting all of the files in the group without entering each filename separately. For example:

`MEMO?`	Includes MEMO, MEMO1, MEMO2, and MEMOS, but not MEMOS1 (because of the extra character).
`*.EXE`	Is the same as ????????.EXE and represents all files with an .EXE extension.
`PROG*.BAS`	Is the same as PROG????.BAS and includes PROG1.BAS and PROG2.BAS.
`*.*`	Includes all files in the current directory.
`B:*.*`	Includes all files on drive B.

Here are some specific examples of using wildcards in MS-DOS commands (remember to press Enter after typing a command):

- To list all files with the extension .BAS on drive B, type:

```
DIR B:*.BAS
```

- To copy all .TXT files from drive A to drive B and rename them with the .DOC extension, type:

```
COPY A:*.TXT B:*.DOC
```

- To delete all files from the current directory whose names begin with ME and are followed by a single character, type:

```
DEL ME?
```

Some MS-DOS commands operate only on single files, not groups of files. With these commands, you cannot use wildcard characters. See the description of the specific command, as appropriate.

Maintaining files

Here are some good file management techniques to follow:

- Delete files you no longer need.
- Give files new names if they contain new information that no longer matches their names.
- Make copies of important files.

Chapter 3 provides general descriptions of the MS-DOS commands you use to maintain your files, and Chapter 4 describes each command in detail. Additionally, Epson has created a command named XTREE that simplifies file management. See Chapter 5 for a description of XTREE.

Protecting files

Follow these precautions to safeguard the information you store on disk:

- Copy new data to backup diskettes every day to ensure your backup copy is up-to-date.
- Never remove a diskette when a file is open.
- Never remove a diskette when the drive's light is on. (This does not physically damage the diskette, but may prevent important data from being written to the disk.)
- Write-protect important diskettes and backup copies. This prevents the disk drive from writing on the disk. (Be aware that some application programs do not work properly if the program diskette is write-protected.)

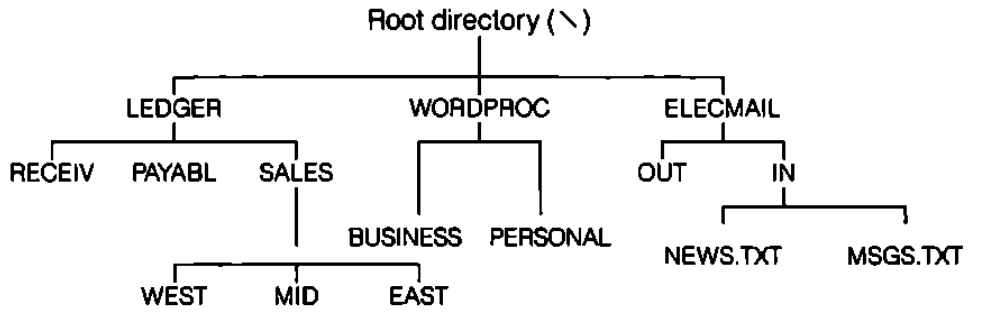
Additionally, you can prevent any file from being accidentally altered by designating it as *read-only*. To do this, use the ATTRIB command, described in Chapter 4.

Creating and Using Directories

MS-DOS stores the files you create in directories. This makes it easier for you to organize and find your files. A directory contains specific information about each file such as its name, size, and the date and time you last updated the file.

At the top is the main directory, called the *root* directory. If you never create your own *sub*directories (from the root directory), MS-DOS stores all your files in the root directory. As you create more files, it may become difficult to find them because they are all in one directory. For better organization, you can create separate subdirectories in which to store your files.

The root directory can contain many subdirectories, and each subdirectory can contain other subdirectories. In this way, you can set up your files in a tree-like structure such as this:



Each subdirectory has a name, and you can access any file in any subdirectory by using a *pathname*. The root directory does not have a name, but is always identified by a backslash (\). The name of a subdirectory can be up to eight characters long, consisting of letters and numerals, but no punctuation marks.

The directory you are working in is called the *current* directory. Usually, when you first load the operating system, the root directory is the current directory. To list the files in the root directory, type DIR and press **Enter**. The screen displays the following above the file names:

```
Directory of A:\
```

If you are working in a directory named LEDGER, the screen displays the following above the list of files:

```
Directory of A:\LEDGER
```

There are six basic operations you need to know to create and use directories:

- Creating directories
- Changing directories
- Using pathnames
- Copying from one directory to another
- Displaying a list of all directories
- Deleting a directory.

These procedures are described below, using examples from the tree illustration above.

Creating directories

Use the MKDIR command to create a directory. (MKDIR stands for Make Directory.) For example, to create the LEDGER directory under the root directory, type the following and press **Enter**:

```
MKDIR \LEDGER
```

To save a few keystrokes, you can type just MD instead of MKDIR. For example, to create the SALES directory under LEDGER, type the following and press **Enter**:

```
MD \LEDGER\SALES
```

Once you have created a directory, you can store your files there. You can also copy files from one directory to another; this procedure is described later in this section.

To check that the LEDGER directory is in the root directory, type DIR and press Enter. The screen displays a list of files in the root directory, along with the new subdirectory:

```
LEDGER   <DIR>
```

The <DIR> after a name identifies it as a subdirectory of the current directory (in this case, the root directory).

If you want to access files stored in a directory other than the current one, you must first do one of the following:

- Change directories
- Specify the pathname.

Putting files in separate directories is almost the same as putting them on separate disks. You have to specify the pathname or change directories to access files in different directories just as you have to specify the drive or log onto a different drive to access files on different disks.

Changing directories

To change directories, merely type CHDIR (or CD) followed by a backslash and the name of the directory. For example, to change to the LEDGER directory, type the following and press Enter:

```
CD \LEDGER
```

CD or CHDIR stands for Change Directory, the backslash (for root directory) specifies that the new directory is a subdirectory of the root directory, and LEDGER is the name of the new directory.

Once you are in the directory, you can directly access any files it contains.

When you change to a subdirectory of the current directory, you do not need to enter the backslash. For example, to change to the SALES subdirectory while you are in the LEDGER directory, type the following and press **Enter**:

```
CD SALES
```

To return to the root directory, type the following and press **Enter**:

```
CD \
```

This command takes you back to the root directory from any subdirectory.

Using pathnames

You can access files in a different directory without leaving the current one by specifying a path along with the filename. The path consists of a series of directory names separated by backslashes.

Normally, MS-DOS begins searching for a file in the current directory. When you set a path, MS-DOS searches for the file in all the directories in the designated path. For example, if you are in the LEDGER directory and want to access a file named BETTY under the PERSONAL directory, you would type the following pathname and press **Enter**:

```
\WORDPROC\PERSONAL\BETTY
```

The pathname \WORDPROC\PERSONAL\BETTY is the full pathname for the file BETTY. You can use it no matter what directory you are in (as long as it is on the same disk). The first backslash (for root directory) signifies that the path to the file starts in the root directory. WORDPROC is the name of the subdirectory under the root directory, and PERSONAL is the subdirectory under WORDPROC.

In a pathname, the filename is always last and is always preceded by a backslash. A backslash at the beginning of a pathname signifies the root directory, but subsequent backslashes merely separate directory levels.

If you want to access a file on a different drive, just include the drive letter in the pathname as in this example:

```
B:\WORDPROC\PERSONAL\BETTY
```

Other directory commands—MS-DOS lets you substitute a drive letter for a directory path. This is helpful when you use a long path. For more information, see the SUBST command in Chapter 4.

The APPEND command lets you set a search path to directories containing data (text) files. Another MS-DOS command, PATH, lets you specify a search path for external commands or program files (those having an extension of .COM, .EXE, or .BAT). This saves you the trouble of entering the complete pathname when looking for these types of files. See the descriptions of APPEND and PATH in Chapter 4.

Copying from one directory to another

You can copy files from one directory to another with the COPY command. Simply specify the pathname for the file you want to copy and for the directory to which you want the copy to go. For example, if you are in the WORDPROC directory and want to copy BETTY from the PERSONAL subdirectory to the BUSINESS subdirectory, type the following and press **Enter**:

```
COPY PERSONAL\BETTY BUSINESS
```

Be sure to type a space between the filename and the new pathname. Note that you do not type a backslash before PERSONAL or BUSINESS because they are subdirectories of the current directory. If you do enter the backslashes, MS-DOS looks in the root directory for the directories and does not find them.

With MS-DOS, you can use two special notations, one for the current directory and one for the next directory up the tree. These two notations are the first entries in each directory other than the root directory:

> This represents the current directory. Typing `DIR .` is the same as typing `DIR` without the period.
>
> This represents the next directory above the current one, called the parent directory. If EAST is your current directory, typing `DIR ..` displays the contents of the SALES subdirectory.

Your word processing or other application program may have other methods of creating and changing directories, but the above descriptions of commands and pathnames should help you organize your files in any application program.

Displaying a list of directories

With the TREE command, you can display a list of all the directories on the specified drive. For example, to see the names of all the directories on the default drive, type the following and press **Enter**:

```
TREE
```

The screen displays a report such as the following for every directory on the drive:

```
Path: C:\LEDGER

Sub-directories: RECEIV
                 PAYABL
                 SALES
```

If you want to see a list of all the files in the directories, add the command switch /F (switches are described in Chapter 3):

```
TREE /F
```

The screen displays the directory information as shown above plus the names of all the files in each subdirectory, for example:

```
Path: C:\SALES

Sub-directories: None

Files:            DECSALES
                  FORECAST.88
                  OCTSALES
                  NOVSALES
```

Note
When using the TREE command, be sure you are logged onto the drive (and directory) where TREE.COM is stored or specify the drive location in the command.

Removing a directory

If you no longer need a directory, you can remove (delete) it with the RMDIR (Remove Directory) command. But first, you must be sure the directory does not contain any files; you cannot remove a directory that is not empty. If you are sure you don't want to keep any of the files in the directory, delete them first; then you can remove the directory.

To remove an empty directory, such as the WEST directory under LEDGER, type the following and press **Enter**:

```
RMDIR \LEDGER\WEST
```

You must give the complete pathname when removing a directory.

Chapter 3

Using MS-DOS Commands

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MS-DOS Command Overview

To help you understand how MS-DOS works, this section presents an overall look at the different categories of MS-DOS commands.

Internal and external commands

Each MS-DOS command is either internal or external. Internal commands are built into MS-DOS. Once you have started your computer and loaded MS-DOS, you can execute these internal commands any time. External commands are stored on your system diskettes as program files. Any file with an extension of .BAT, .COM, or .EXE is considered an external command. MS-DOS must read these commands from the disk before you can run them.

Your system diskettes contain the files you can access. You can view these files on your screen when you type the directory command, DIR, and press Enter.

Two files on the system diskettes do not appear in the directories. These files contain the instructions that make up the operating system. To protect these files from being accidentally changed or erased, they do not appear in your diskette directory and you cannot access them.

The internal commands, which are always immediately available in memory, do not show on the directory either. These commands are stored in the COMMAND.COM file. COMMAND.COM is the command interpreter, which displays the A> prompt, accepts your commands, and runs programs. Only COMMAND.COM itself appears in the system diskette directory. These are the internal commands:

BREAK	DIR	MKDIR	SET
CHCP	ECHO	PATH	SHIFT
CHDIR	ERASE	PAUSE	TIME
CLS	EXIT	PROMPT	TYPE
COPY	FOR	REM	VER
DATE	GOTO	RENAME	VERIFY
DEL	IF	RMDIR	VOL

It's easy to understand the MS-DOS commands if you think of them in these functional categories:

- Diskette operations
- Hard disk operations
- File operations
- Directory operations
- System configuration and operation
- Batch processing operations
- Programming tools.

Every MS-DOS command falls into one of these categories. The remainder of this chapter examines the commands by category, name, and function.

Diskette operations

The following files on your system diskettes let you manage the information on your diskettes:

CHKDSK.COM enables you to check the status of a diskette to determine the available space and the size of your files. CHKDSK also checks and reports the condition of diskettes and files and, optionally, fixes any errors found in the directory or file allocation table. (CHKDSK functions in the same manner on a hard disk.)

DISKCOMP.COM compares diskettes and identifies differences between them. This is useful if you need to determine whether two diskettes are exactly alike or if you want to verify a DISKCOPY operation.

DISKCOPY.COM copies the complete contents of one diskette to another. (It formats the diskette if necessary.)

FORMAT.COM formats diskettes and, optionally, installs system files and puts volume labels on diskettes. Before using new diskettes for the first time, you must format them.

LABEL.COM allows you to create, change, or delete a diskette volume label.

SYS.COM transfers operating system files from one diskette to another.

Hard disk operations

The following files on your system diskettes allow you to prepare and maintain a hard disk:

BACKUP.COM enables you to back up hard disk files. Use this command to store your hard disk files on diskettes. (Restore them from diskettes to the hard disk with the RESTORE command.)

FDISK.COM partitions the hard disk to establish a work area for the MS-DOS operating system on your hard disk. It also enables you to start MS-DOS automatically from your hard disk (rather than a diskette) every time you turn on or reset your computer.

HDCACHE.EXE enhances the performance of a hard disk by storing the location of requested sectors in a reserved part of memory.

RESTORE.COM lets you restore hard disk files. Use this command to restore your files from diskettes (which you stored previously with the BACKUP command) to the hard disk.

SELECT.COM lets you format your hard disk for the first time, simultaneously copying the MS-DOS files to the hard disk, choosing a keyboard layout, and labelling the hard disk.

File operations

The following files on your system diskettes help you manage your files:

ATTRIB.EXE allows you to set or reset the read-only attribute of a file and set the archive bit on or off. You can also use this command to display the attributes of a file. By setting a file's attribute to read-only, you protect the file from being accidentally altered or deleted.

COMP.COM lets you compare the contents of two files or two groups of files to see if they are different.

FASTOPEN.EXE speeds up file access time by storing the location of directories in the computer's memory.

FC.EXE compares two files and either verifies that they are identical or reports the differences.

FIND.EXE locates text strings within files.

MORE.COM is a command filter you can use when displaying files. This command filters screen output so that a pause occurs each time the screen fills. (Filters are described below.)

PRINT.COM is the file printing command that outputs your DOS text files to a printer. While your file is printing, you can use the computer for other tasks.

RECOVER.COM attempts to save damaged disks or disk files. Use this command if you continually receive disk error messages when accessing a particular disk or file.

SHARE.EXE is the command that sets up your computer to support file sharing through the network system. This command has no effect unless a network system has been installed.

REPLACE.EXE lets you replace files on the target disk with files of the same name from the source disk. You can also add new files, copying them from the source to the target.

SORT.EXE sorts strings in text files. This command arranges the records in a file in alphabetical or numerical order.

XCOPY.EXE lets you copy groups of files or entire subdirectories.

Internal commands—These internal commands also help you manage your files:

COPY copies your files to other disks, directories, or devices.

DEL, also called *ERASE*, deletes files from your disks.

RENAME, also called *REN*, renames files on your disks.

TYPE displays DOS text files on your screen.

Directory operations

The following files on your system diskettes create and maintain directories:

APPEND.EXE displays or sets paths to directories containing data files.

JOIN.EXE connects a directory on one drive to an entirely different drive. This allows certain applications to access a different drive without having to change the current drive.

SUBST.EXE allows you to substitute a different drive letter for another drive or path. Using this command, you can shorten a long path name to just one letter.

TREE.COM allows you to display all the directories on a disk and, optionally, list all the files they contain. Use this command to display your disk file structure in one complete listing.

Internal commands—These internal commands also maintain your directories:

CHDIR, also called *CD*, shifts you to a different directory within the directory structure of a disk.

DIR displays the contents of a disk directory.

MKDIR, also called *MD*, creates (makes) a new directory on your disk.

RMDIR, also called *RD*, removes an empty directory from your disk.

MENU, SETPRINT, and XTREE utilities

Epson offers three menu utilities: MENU.EXE, SETPRINT.EXE, and XTREE.EXE. MENU provides simple, easy-to-use menus for certain complex MS-DOS commands and also lets you access any MS-DOS command. SETPRINT lets you define the printing defaults for your printer. XTREE simplifies the use of several file and directory maintenance commands by providing a convenient menu for the DIR, DEL, COPY, ATTRIB, TYPE, REN, MKDIR, RMDIR, CHDIR, TREE, LABEL, and VOL commands. See Chapter 5 for instructions on these menu utilities.

System configuration and operation

The following files on your system diskettes let you define your system's configuration and operation:

ANSI.SYS is a file that contains a set of standard escape codes for console control. Some application programs you run may require this standard console driver interface. If so, the documentation for the application program specifies it. When you do need ANSI.SYS, enter it in the CONFIG.SYS file with the command DEVICE=ANSI.SYS. This automatically places it in memory at startup. See Chapter 6 for information on CONFIG.SYS and Appendix E for more details about ANSI codes.

ASSIGN.COM allows you to assign a drive letter to a different drive. Because some application programs require that you place data diskettes in a particular drive, this command is useful in redirecting input/output to a drive of your choosing.

DRIVER.SYS lets you copy files from one drive to the *same* drive when the system has more than one diskette drive. Without DRIVER.SYS, files are automatically copied to the second drive. When you need DRIVER.SYS, just list it in a CONFIG.SYS file with the command DEVICE=DRIVER.SYS. This automatically places it in memory at startup. See Chapter 6 for more information on CONFIG.SYS and DRIVER.SYS.

GRAFTABL.COM loads a special character generator table for use when the display screen is set to graphics mode.

GRAPHICS.COM (for 9-pin printers) and *GRAPH24.COM* (for 24-pin printers) let you make exact printed copies of your screen's image.

HELP.COM displays information about all the MS-DOS commands and utility programs.

KEYB.COM loads a special program that redefines the keyboard country layout.

MODE.COM allows you to change the configuration of printer output, monitor output, serial port operation, and code pages.

NLSFUNC.EXE enables code page switching.

VDISK.SYS simulates a disk drive by using a portion of your computer's memory as the storage medium. When you need VDISK.SYS, just list it in a CONFIG.SYS file with the command DEVICE=VDISK.SYS. This automatically places it in memory at startup. See Chapter 6 for more information on CONFIG.SYS and VDISK.SYS.

XTREEINS.EXE lets you install and customize XTREE for your monitor. XTREE.EXE and XTREEINS.DAT work with XTREEINS.EXE. All three files must be in the same directory for the program to operate. See Chapter 5 for information.

Internal commands—These internal commands also let you configure and operate your system:

BREAK enables or disables command aborting by **Ctrl C**.

CHCP displays or changes the current code page (character set).

CLS clears the screen.

CTTY changes the standard input/output device.

DATE displays and allows you to set the date.

EXIT returns to an application program after loading and executing COMMAND.COM from the application.

PATH displays or sets paths to directories containing command files.

PROMPT restores or changes the characters that make up the command prompt.

SET displays or sets your system parameters in the current environment.

TIME displays and allows you to set the time.

VER displays the number for the MS-DOS version you are using.

VERIFY enables or disables a verification of all files written to disks.

VOL displays the volume identification of your disks.

Batch processing operations

The commands you use for batch processing are all internal commands. These commands add flexibility and power to your batch programs. However, you do not need to use any of these commands in order to use your operating system or application programs.

CALL allows a batch file to call another batch file without loading another copy of COMMAND.COM.

ECHO enables or disables screen output during batch file operations.

FOR allows conditional repetitive processing in batch file operations.

GOTO jumps to a specified label in batch file operations.

IF specifies parameters for conditional processes in batch file operations.

PAUSE interrupts processing of batch files until you are ready to continue.

REM lets you add remark statements to batch files to explain their operation.

SHIFT allows you to access more parameters in batch files.

Programming tools

Your system diskettes contain four standard MS-DOS utilities you can use in programming and designing assembly routines. You do not need to run any of these in order to use your operating system or application programs.

DEBUG.COM is the debugging tool that examines and modifies code and data in memory. This command monitors and modifies your computer's memory.

EDLIN.COM is the editing utility for creating and modifying text files.

EXE2BIN.EXE is the conversion utility for changing .EXE files into .BIN files.

LINK.EXE is the utility that combines your object code modules into one executable program. Use this command when constructing programs. (You need a language assembler or compiler to create object modules.)

Entering Commands

This section explains the format for giving MS-DOS commands and the various parameters you can use. It also describes how to group commands in a batch file and redirect input or output from one device to another.

Command formats

To enter an MS-DOS command, you must understand the format of the command. The format specifies everything MS-DOS needs to perform a task. This includes the name of the command and any parameters.

In this manual, the command name appears in all uppercase letters. You can actually enter the name in upper- or lowercase letters. MS-DOS does not recognize a difference.

The parameters you specify for each command are determined by the command itself. Some parameters are required while others are optional.

This manual uses certain symbols and typographical conventions to illustrate what the command parameters are and how you enter them.

In this manual square brackets ([ ]) indicate an optional entry. Ellipses (...) indicate that you may repeat a parameter as many times as needed or desired. Do not enter the brackets or the ellipses when you type the command.

You must enter the following items:

- All other punctuation such as commas, colons, slash marks, and equal signs, *exactly* as shown.
- Any parameter that does not have square brackets around it. (This indicates that the command requires these parameters.)
- All items shown in uppercase letters. (While you can enter commands in upper- or lowercase, be sure to spell them correctly.)

Items shown in lowercase italic letters are parameters, as in this example:

```
TYPE filename
```

You must enter both TYPE and *filename* because they are shown without special symbols. TYPE is the name of the command and *filename* is a parameter. You can type any filename.

The chart below identifies the parameters you see in this book. The descriptions show both the format and an example for each of the parameters. The format shows what you see in the Format section for each command (in chapters 4, 6, 7, and 8) and the example shows one example of what you could type for that parameter.

Parameter	*Description*
d:	Disk drive descriptor such as A: or B:. Shows which drive contains the file or files you want. A colon always follows a disk drive descriptor. Format: *d:* Example: A:
path	The path name showing how to locate the file on the disk, including any necessary backslashes and the name of each directory in the path. Format: *path* Example: \LEDGER\SALES\WEST The total number of characters in the path must not exceed one line on the screen.
filename	The name of a file with or without an extension. This parameter does not include the disk drive descriptor. When you do not use a disk drive descriptor, MS-DOS looks for the file on the disk in the currently logged drive. Filenames can be from one to eight characters. The optional extension can be up to three characters.

Note
Whenever a file is part of a path, the filename must be preceded by a backslash. The filename is always the last name in a path, separated from the last directory name by a backslash.

You can use wildcard characters in the filename unless noted in the command description. The wildcard characters are * and ?. Chapter 2 describes how to use wildcard characters.

Format: *filename*
Example: NEWS.TXT

n or *nnn* A number that varies according to the command.

Format: *n*
Example: 9

x or *xxx* A character (or characters) that varies according to the command.

Format: *x*
Example: R

Certain commands may allow or require other parameters not shown here. The individual descriptions for these commands (in chapters 4 through 8) identify any special parameters.

For instance, some commands can include optional switches that affect the way the commands work. You always precede the switch name (usually a letter) with a slash (/).

A typical command format using switches looks like this:

```
DIR [d:][path][filename][/P][/W]
```

You can enter this DIR command in a number of ways, each yielding different results. Some examples are:

```
DIR
DIR \LEDGER\SALES
DIR B:\
DIR A:ACCPAY/P
DIR C:/W
```

Rules for entering commands

Follow these rules when entering MS-DOS commands. Remember, one or more parameters usually follow command names:

- Enter command names and parameters in either uppercase or lowercase letters.
- Separate command names and parameters by *delimiters*. You usually use spaces or commas as delimiters. For example:

  ```
  TYPE TEXTFILE
  ```

  You can also use the semicolon (;), the equal sign (=), or the tab key as delimiters. This manual shows the space only.
- You do not need to separate a file specification with delimiters because the colon, backslash, and the period already serve as delimiters:

  ```
  A:\SALES\LETTER.DOC
  ```
- Include the file extension when referring to a file with an extension.
- For an external command, type the command *without* its extension (.COM, .EXE, or .BAT). For an internal command, there is no extension; simply type the command name.
- For an external command, you may need to add the drive descriptor and directory if the file is not in the current directory. For example, if you are logged onto Drive B and want to use the MENU program, which is on Drive A in the \DOS directory, you would type:

  ```
  A:\DOS\MENU
  ```

- You can specify a path preceding the name of a command. This allows you to store the MS-DOS commands in subdirectories.
- You can use batch processing commands, such as IF and FOR, when specifying an MS-DOS command.
- Always press **Enter** to execute a command.

This version of MS-DOS provides network support. You can use most MS-DOS commands on a network disk, directory, or printer. The following commands, however, may not work in a network environment:

CHKDSK
DISKCOMP
DISKCOPY
FORMAT
JOIN
LABEL
RECOVER
SYS

Using batch files to combine MS-DOS commands

If you find yourself typing the same sequence of commands over and over, you can list the commands in a special file called a batch file. When you execute the batch file, MS-DOS processes the entire sequence of commands in the order you entered them.

You can store in a batch file any command that you normally run from the command prompt.

You can create batch files with any text editor including the MS-DOS Line Editor, EDLIN (described in Chapter 8). You can also use the COPY command with the CON device. The CON device allows you to enter data from your keyboard and copy the data to a file.

The batch filename must include the extension .BAT so that MS-DOS recognizes it as a batch file. To execute a .BAT file, type its name without the extension. For example, if your batch filename is END.BAT, type END and press **Enter**.

As an example, follow the steps below to create a batch file called SAMPLE.BAT. It will erase all files on drive A with an extension of .BAK, display a message indicating the files have been erased, and display the directory of A. (This example uses the COPY command with the CON device.)

Type each of the following lines exactly as shown. Press **Enter** after typing each line:

```
COPY CON SAMPLE.BAT
DEL A:*.BAK
REM All .BAK files have been erased.
DIR A:
```

Press **Ctrl Z** and then **Enter** to close the file.

Now, to use this batch file, simply type SAMPLE at the command prompt and press **Enter**.

You can specify another batch file as the last command in a batch file. In this way, you can link batch files.

If you press **Ctrl C** while MS-DOS is executing a batch file, you see the following prompt:

```
Terminate batch job (Y/N)?
```

Press **Y** to cancel execution of the remainder of the batch file commands and return to the command prompt. Or press **N** to complete execution of the current command and continue processing the remaining commands.

If you remove the diskette containing the batch file during execution, MS-DOS prompts you to insert it again before the next command can be read. You see this message:

```
Insert diskette with batch file
and press any key when ready
```

The AUTOEXEC.BAT file—When you boot MS-DOS, the command processor looks for a file called AUTOEXEC.BAT on your system diskette or hard disk. AUTOEXEC.BAT is simply a batch file you can create to automate your system boot-up routine. By grouping several commands in this file, you can tell your computer to perform them automatically, in sequence, every time you load MS-DOS.

You must store AUTOEXEC.BAT in the root directory of your MS-DOS startup diskette or hard disk. If the command processor finds AUTOEXEC.BAT, the batch file immediately executes, bypassing the date and time prompts. See Chapter 7, Batch Processing Commands, for more information.

You can create AUTOEXEC.BAT with a text editor such as EDLIN. If you use the COPY command with the CON device, remember to press **Ctrl Z** or **F6** and then press **Enter** to close the file.

Creating a batch file with replaceable parameters—You can create a batch file with replaceable parameters, enabling you to run the same batch file with different sets of data.

You can specify up to 10 *dummy* parameters (%0 through %9) within a batch file. When you execute the batch file, the values you supply sequentially replace the %1 through %9 parameters. The filename of the batch file and the disk drive descriptor, if specified, always replace the %0 parameter.

As an example, create a a batch file called MYFILE.BAT that consists of three lines:

```
COPY %1.MAC %2.MAC
TYPE %2.PRN
TYPE %Ø.BAT
```

To run the file, type the following and press **Enter**:

```
MYFILE A:PROG1 B:PROG2
```

The program substitutes MYFILE for %0, A:PROG1 for %1, and B:PROG2 for %2. The result is the same if you execute the following commands:

```
COPY A:PROG1.MAC B:PROG2.MAC
TYPE B:PROG2.PRN
TYPE MYFILE.BAT
```

If you use the percent sign as part of a filename within a batch file, you must type it twice. For example, to specify the file ABC%.EXE, you type `ABC%%.EXE` in the batch file. When the batch file executes, you see `ABC%.EXE`, not `ABC%%.EXE`.

Input and output

MS-DOS assumes that the keyboard is your input device and the monitor is your output device. You can redirect the input or output to a file or another device (such as a printer). You can also use filters and pipes (described below) to manipulate your input and output.

Redirecting input and output—You can instruct a program to read input from a file rather than the keyboard, and you can direct output to a file or printer instead of the monitor screen.

To direct MS-DOS to read input from a file instead of the keyboard, use the less-than sign (<) before the filename. For example, this command sorts the text file NAMES.TXT:

```
SORT <NAMES.TXT
```

To direct output to a file instead of the monitor screen, use the greater-than sign (>) before the filename. For example, this command stores the directory of the default disk drive in a file called MYFILES.DIR:

```
DIR >MYFILES.DIR
```

Note
If the file MYFILES.DIR already exists, MS-DOS overwrites what is in the file with the new data.

If you want to append (add) data to a file, rather than overwrite the file, type two greater-than signs (>>) before the filename. (If the file does not exist, MS-DOS creates it.) For example, this command appends the directory listing of the default drive to the existing file named MYFILES.DIR:

```
DIR >>MYFILES.DIR
```

MS-DOS recognizes a printer by two device names: PRN and LPT1. Use either of these device names to redirect data output to a printer. For example, to send the file ABCDIR to the printer, turn on the printer and use one of the following commands:

```
COPY ABCDIR PRN:

COPY ABCDIR LPT1:
```

You can send the MS-DOS file EPSON.TXT to the printer with either of the following commands:

```
TYPE EPSON.TXT >PRN:

TYPE EPSON.TXT >LPT1:
```

The RS-232C serial port can both send and receive data. Therefore, output can be sent to it, and input can be accepted from it. The device names for the RS-232C port are AUX, COM1, COM2, COM3, and COM4. (COM2, COM3, and COM4 are available only if you have installed additional serial ports in your computer.)

To communicate with another MS-DOS based computer via the RS-232C serial port and send the EPSON.TXT file to the other computer, follow these steps:

1. Match signal parameters with the SETUP or MODE command.
2. Type the following, but *do not press* **Enter**:

   ```
   COPY EPSON.TXT AUX:
   ```

3. Wait for the receiving end to type `COPY AUX: EPSON.TXT`.
4. When the receiving end presses **Enter**, you must press **Enter**.

Using filters—A filter is a command that reads your input, changes it in some way, and then outputs it. In this process, the data is filtered by the program.

MS-DOS filters include the following:

- FIND searches for a constant string of text in a file.
- MORE displays text on your screen one screen page at a time.
- SORT sorts text in alphabetical or numerical order.

You can put these filters together in many different ways and create functions that take the place of a large number of specific commands. See Chapter 4 for more details.

Command piping—You can give more than one command to the system at a time by piping commands to MS-DOS. To do this, enter a pipe separator (¦) between command names. For example, this command gives you an alphabetically sorted list of your directory:

```
DIR ¦ SORT
```

The pipe separator sends all output for processing—generated by the command on the left side—to the command on the right side of the bar. In other words, the output from the command on the left becomes the input for the command on the right.

You can link more than two commands. For example, this command sequence sorts your directory and displays it one screen at a time:

```
DIR ¦ SORT ¦ MORE
```

You can link several commands together as long as the output of one is usable as the input of the next.

Chapter 4

Alphabetical List of MS-DOS Commands

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Introduction

This chapter and the following four chapters contain descriptions of the MS-DOS commands in alphabetical order. The most commonly used commands are covered in this chapter. Chapter 5 describes three menu utilities created by Epson: MENU, SETPRINT, and XTREE. Chapter 6 describes the commands stored in the CONFIG.SYS file, Chapter 7 describes batch processing commands, and Chapter 8 describes programming commands.

For a general description of the functional categories of commands, see "MS-DOS Command Overview" in Chapter 3. For instructions on how to enter commands, see "Entering Commands," also in Chapter 3.

The commands are presented in a standard format that provides the following information:

- Command name—appears at the top of the page in bold uppercase letters.
- *Internal* or *External*—appears across from the command name and identifies whether the command is internal or external.
- Purpose—briefly describes what the command does.
- Format—gives the correct syntax for entering the command. Be sure to read "Command Formats" in Chapter 3 for a complete explanation of the command syntax.
- Description—explains in greater detail how to use the command.
- Cautions—when applicable, identify any special conditions to avoid or be aware of when giving the command.
- Examples—show one or more examples of the command and describe the result.

About the command format

Although the Format section of each command may require more than one line to show all the possible variables, you should always type the complete command on one line, including all parameters, before pressing Enter.

To execute an external command, you must either be logged onto the drive and directory where the command is stored, or you must enter the drive descriptor and path before the command name. For example, here's how this manual presents the external command FDISK:

```
[d:][path]FDISK
```

If FDISK is on drive C in the \DOS directory and you are currently logged onto drive A, you would type:

```
C:\DOS\FDISK
```

APPEND

External

Purpose

Sets a search path for data files. With the /X switch, also sets a path for executable files.

Format

First time:

```
[d:][path]APPEND [d:]path[;[d:]path...]
```

or:

```
[d:][path]APPEND [/X][/E]
```

If APPEND has already been loaded:

```
APPEND [d:]path[;[d:]path...]
```

or:

```
APPEND [;]
```

Description

Use APPEND to identify the directories that you want MS-DOS to search to locate files that are not in the current directory. Once the APPEND command is entered after loading MS-DOS, you can access files that are in different directories without entering their pathnames.

Whenever you request a file from MS-DOS, it first searches the current directory, then the directories listed in the APPEND command, then any directories specified with the PATH command.

Because the APPEND command is an external command, you need to precede it with the drive descriptor and pathname the first time you give the command if APPEND is not in the current directory. After APPEND is loaded in memory, however, it is an internal command. Therefore, if you give the APPEND command again later, you do not need to specify its location.

Use the format APPEND *path;path;path* to specify several paths by separating each path with a semicolon. MS-DOS searches the paths in the order you specify.

Type APPEND; (with a semicolon) to set a null path. This instructs MS-DOS to look only in the current directory for the specified file or files.

To display the current search path, type only APPEND, with no pathnames or parameters.

Each time you use the APPEND command, the new path you specify replaces the path specified in the previous APPEND command.

You can use the following switches with APPEND:

Switch	*Function*
/X	Appends program files to the specified path in addition to data files
/E	Stores the APPEND paths in the DOS environment

Normally, you would use the APPEND command to locate data files and the PATH command to locate executable files—program files that have an extension of .COM, .EXE, or .BAT. However, you can add the /X switch to the APPEND command to include program files, as well as data files, in the search path. This switch is effective only if you include it the first time you give the APPEND command after loading MS-DOS. You cannot use the /X switch and specify the search path at the same time; use the /X switch first, and then give the APPEND command again to set the search path.

Note

Certain MS-DOS commands, such as BACKUP and RESTORE, set their own search paths. If you include the /X switch the first time you give the APPEND command, you must set the search path to null with the command APPEND; before using either the BACKUP or RESTORE command.

Use the /E switch to store the APPEND paths in the DOS environment. This enables you to display and change the APPEND DOS environment values with either the APPEND or SET command. Without the /E switch, MS-DOS stores the paths only in APPEND, and you can use only the APPEND command to display or change paths. For the command to be effective, you must include the /E switch the first time you give the APPEND command after loading MS-DOS.

Cautions

Although APPEND can retrieve a file from a different directory, it does not automatically return the file to its proper location when storing the file. If you edit a file from another directory that was located by the APPEND command, be sure to specify the complete pathname when you store the file. Otherwise, the file is stored in the *current* directory, not the one it came from.

If you use the ASSIGN command to reassign drives, do so after you give the APPEND command the first time.

The maximum number of paths you can specify in an APPEND command is 127. The maximum number of characters you can include in a single command is 256.

If you make any mistakes when entering the path information in the APPEND command, such as an invalid drive descriptor or path name, MS-DOS does not detect the error until it needs to search for the specified paths.

Examples

To tell MS-DOS to search your WORDPROC\BUSINESS directory on drive C for data files and program files, type the following two commands, pressing **Enter** after each:

```
APPEND /X
APPEND C:\WORDPROC\BUSINESS
```

The command with the /X switch must come first and must be the first APPEND command after MS-DOS has been loaded.

To search this path and two others, type the following and press **Enter**:

```
APPEND C:\WORDPROC\BUSINESS;\ELECMAIL\IN;
\LEDGER\SALES
```

Now you can access any of the data or program files in these directories without specifying the pathname.

To display the current APPEND path, type the following and press **Enter**:

```
APPEND
```

For the previous path, the screen displays the following:

```
APPEND=C:\WORDPROC\BUSINESS;\ELECMAIL\IN;
\LEDGER\SALES
```

To tell MS-DOS to search only the current directory and *not* the above path, type the following and press **Enter**:

```
APPEND;
```

ASSIGN

External

Purpose

Assigns a new letter to a drive specification.

Format

`[d:][path]ASSIGN [d1=d2...]`

Description

Use ASSIGN to assign different letters to your disk drives. This can be helpful when an application program recognizes only drives A and B and does not allow you to specify another drive such as C. Entering this command lets you use other drives.

In the ASSIGN format, *d1* is the disk drive to receive the new letter and *d2* is the new letter. Both drives must exist; that is, they must be a diskette drive, a hard disk drive, or a device driver such as VDISK.

To cancel the assignment, type ASSIGN without parameters. This resets all drive letters to their original drive assignments.

Cautions

Use ASSIGN only when necessary. When you are done, cancel the assignment. Do not use ASSIGN during normal use of MS-DOS.

Do not use the ASSIGN command with BACKUP, JOIN, LABEL, PRINT, or RESTORE. If you do, you could destroy data because ASSIGN hides the true device type. DISKCOMP, DISKCOPY, and FORMAT ignore any reassignments made with ASSIGN.

Examples

To make all references to drive B act upon drive C, type the following and press **Enter** (do *not* type colons):

```
ASSIGN B=C
```

Now, if you type `DIR B:`, you see the list of files on drive C.

To make all references to drives A and B act upon drive C, type the following and press **Enter**:

```
ASSIGN A=C B=C
```

To reset all drives to their default assignments, type the following and press **Enter**:

```
ASSIGN
```

ATTRIB

External

Purpose

Sets, displays, or removes the read-only attribute or archive bit for a file or group of files.

Format

`[d:][path]ATTRIB [±R][±A] [d:][path]filename[/S]`

Description

Use the ATTRIB command to give you an extra level of protection for important data files that you store on disk. Using ATTRIB, you can set a file's attribute to read-only. This allows the file to be read, but not altered or deleted. (This is not the same as write-protecting the file.)

You can also use ATTRIB to set a file's archive bit on or off. The archive bit tells MS-DOS which files have been altered so commands such as BACKUP and XCOPY know which files to copy.

Note

An easier way to use the ATTRIB command is through the MENU utility. See Chapter 5 for instructions.

ATTRIB +R sets the read attribute of the specified file to read-only. ATTRIB −R removes the read-only attribute, allowing you to alter or delete the file.

ATTRIB +A sets the archive bit of the specified file so XCOPY and BACKUP know to copy the file. ATTRIB −A turns off the archive bit, indicating the file has not been altered and does not need to be archived. After you copy a file with XCOPY or BACKUP, the file's archive bit is reset to A−.

You can use ATTRIB with any logical combination of +R/−R or +A/−A.

If you use ATTRIB without an R or A option, the screen displays the attribute that is currently set for the specified file.

You can use wildcards (* and ?) in the filename to specify groups of files.

Use the /S switch when you want ATTRIB to process every matching file in a specified directory and all of its subdirectories.

Caution

If you use REPLACE /R, you can overwrite a read-only file with the source file. If you use XCOPY /M to copy a file whose archive bit is set, XCOPY will turn off the archive bit of the *source* file. See the REPLACE and XCOPY commands in this chapter.

Examples

To set the read attribute of a file named BETTY to read-only, type the following and press **Enter**:

```
ATTRIB +R BETTY
```

To remove the read-only attribute of all files on drive A, type the following and press **Enter**:

```
ATTRIB -R A:*.*
```

To set the archive bit of all files on drive C in the SALES directory, type the following and press **Enter**:

```
ATTRIB +A C:\SALES\*.*/S
```

The /S sets the archive bit of all files in any subdirectories of the SALES directory.

To turn off the archive bit of a file named MEMO.TXT, type the following and press **Enter**:

```
ATTRIB -A MEMO.TXT
```

In the following example, a file called EPSON.TXT on drive C has been set to read-only (+R) and has had its archive bit set (+A). To display the current attributes of this file, type the following and press **Enter**:

```
ATTRIB EPSON.TXT
```

The screen displays:

```
R A            C:\EPSON.TXT
```

The letters R and A appear only when the applicable attribute is set. If neither attribute is set, using the ATTRIB command with the EPSON.TXT file, the screen displays the following:

```
C:\EPSON.TXT
```

A file's archive bit is always set unless you turn it off. If you have not used the ATTRIB command with the EPSON.TXT file and enter the command `ATTRIB EPSON.TXT`, the screen displays the following:

```
A              C:\EPSON.TXT
```

BACKUP *External*

Purpose

Backs up (copies) one or more files from one disk to another in a special, condensed format.

Format

```
[d:][path]BACKUP d1:[path][filename] d2:[/S][/A][/F]
   [/M][/D:date][/T:time][/L[:[d:][path]filename]
```

Description

Use BACKUP to back up one or more files from one disk to another. You can back up files in any of the following ways:

- Hard disk to a diskette
- Hard disk to a hard disk
- Diskette to a diskette
- Diskette to a hard disk.

BACKUP is most commonly used to back up hard disk files.

Note
An easier way to use the BACKUP command is through the MENU utility. See Chapter 5 for instructions.

Do not confuse BACKUP with COPY or XCOPY. COPY and XCOPY make an exact duplicate of a file. BACKUP creates files that are not usable until they are *restored* with the RESTORE command. The advantage of BACKUP is that you can store more files on a disk because of the condensed format in which the files are stored. Therefore, it is a good idea to use BACKUP when storing files for archive purposes. To back up files you use daily, use COPY or XCOPY.

The disk that contains the files you want to back up is called the *source* disk. The *target* disk is the disk being used to store all the backed up files.

In the command format above, *d1:* represents the source and *d2:* represents the target.

The target diskette's current directory must be the root directory.

You can use the following switches with BACKUP:

Switch	*Function*
/S	Backs up all files in the subdirectories of the specified directory in addition to the files in the specified or current directory. Without the /S switch, only files in the current directory are backed up.
/A	Adds files to the target disk if it already contains backed-up files. Use /A to copy files from the source disk which are not already stored on the target.
/F	Formats the target diskette if it has not already been formatted. The FORMAT command must be accessible from the current path.
/M	Backs up files that have been modified since the last BACKUP.
/D:*date*	Backs up files that have been modified on or after the specified date. The date format depends on the COUNTRY code selected with the COUNTRY command. Use a period or a dash to separate the day, month, and year.
/T:*time*	Backs up files that have been modified on or after the specified time. The time format depends on the COUNTRY code you select with the COUNTRY command. Use a period or dash to separate the hours, minutes, and seconds.
/L:[*d:*][*path*]*file*	Makes a backup log file listing the filenames. If you do not specify a filename, MS-DOS makes the log file BACKUP.LOG on the source disk. MS-DOS cannot make the log file on the target disk.

If you do not specify a drive and path, the log file is stored in the root directory of the source drive. If a log file already exists, the new log information is added to the end of that file.

The first record in the log file specifies the date and time of the backup. Each subsequent record contains the backup disk number and complete pathname and filename for each file backed up.

Before beginning BACKUP, make sure the current directory of your target diskette is the root directory.

If you do not specify the /A switch, BACKUP deletes all files stored on the target disk.

When you use the /A switch to add files to diskettes, be sure to back up the additional files on the last diskette in the series. Otherwise, MS-DOS displays an error message.

BACKUP does not format the target diskettes unless you include the /F switch. If you are going to back up many files (or even a few very large ones), either include the /F switch or be sure to have plenty of formatted diskettes before you begin the procedure.

You can use wildcards to back up groups of similarly-named files including files from different subdirectories.

BACKUP displays the name of each file as it is backed up. After BACKUP fills up a diskette, it prompts you to insert another diskette into the drive.

Label and number each backup diskette in consecutive order. When you RESTORE these files, you will be prompted to insert the diskettes in order.

If the target is a hard disk, backup files are stored in a subdirectory called \BACKUP. If the target is a diskette, backup files are stored in the root directory.

If you want to stop the BACKUP procedure after it has started, press **Ctrl Break**. MS-DOS cancels the command and displays the system prompt on the screen.

If you are sharing files, you can back up only those files that you normally can access. If you try to back up a file that you are not permitted to access, the following message appears:

```
PATHNAME\FILENAME.EXT
Not able to backup at this time
```

BACKUP sets the following exit codes which you can use in processing batch files to troubleshoot potential errors:

0 Normal completion of BACKUP procedure.

1 No files were found to be backed up.

2 Some files were not backed up because of file-sharing conflicts.

3 Terminated by **Ctrl Break**.

4 Terminated because of an error.

Caution

Do not use BACKUP while the APPEND /X, ASSIGN, JOIN, or SUBST commands are in effect.

Examples

To back up all files on the hard disk (drive C) to the diskette(s) in drive A, type the following and press **Enter**:

```
BACKUP C:*.* A:/S
```

This command backs up all files in the current directory and all of its subdirectories on drive C.

To back up the file FILEIT.DOC from drive B to drive A, type the following and press **Enter**:

```
BACKUP B:FILEIT.DOC A:
```

To back up to drive A all files on drive C in the current directory that have been modified since the last BACKUP, and format any unformatted diskettes in the process, type the following and press **Enter**:

```
BACKUP C: A:/M/F
```

To back up all files on drive C that have been modified since March 15, 1988, type the following and press **Enter**:

```
BACKUP C: A:/D:3-15-88/L
```

Using the /L switch creates a log file named BACKUP.LOG in the root directory of drive C that lists all the backup files.

To *add* files from drive B in the WORDPROC directory (and any of its subdirectories) to files already backed up on drive A, type the following and press **Enter**:

```
BACKUP B:\WORDPROC A:/A/S
```

BREAK

Internal

Purpose

Enables or disables the **Ctrl C** function.

Format

```
BREAK [ON]

BREAK [OFF]
```

Description

Use BREAK to turn on or off the MS-DOS abort current command (**Ctrl C**) function. Normally, MS-DOS checks for **Ctrl C** only while it is reading from the keyboard, or writing to the monitor or printer. The standard setting is BREAK OFF.

When BREAK is ON, MS-DOS checks for **Ctrl C** whenever a program requests MS-DOS to perform any function, such as a disk read and/or write.

If you are running an application program that uses **Ctrl C** itself, type BREAK OFF to turn off the MS-DOS **Ctrl C** function. Then, when you press **Ctrl C**, you affect your application program and not the operating system.

When you have finished running your application program and are using MS-DOS, type BREAK ON to turn the **Ctrl C** function on again.

To display the current setting of BREAK, type BREAK only without ON or OFF. If BREAK is OFF, the screen displays:

```
BREAK is off
```

You can also turn on the abort current command function by including BREAK=ON in your CONFIG.SYS file. See Chapter 6.

CHCP

Internal

Purpose

Displays or changes the current code page (character set).

Format

`CHCP [nnn]`

Description

Use the CHCP command to display the current code page or to select a different one. Unlike the MODE command, which lets you change the code page for a particular device, CHCP changes the code page for the entire system.

The *nnn* represents the number of the code page you want to use:

Number	*Code page*
437	United States—English
850	Multilingual
860	Portuguese
863	Canada—French
865	Nordic

If you do not specify a number, the screen displays the number of the current code page for the system.

Before giving the CHCP command, you must do the following:

- Load the NLSFUNC command to provide national language support.
- Use the DEVICE command in the CONFIG.SYS file to enable the device drivers affected by code page switching.
- Use the MODE command with the Codepage Prepare option to prepare the selected code page for the device or devices.

- Be sure that the COUNTRY.SYS file, which contains country information, is accessible to the CHCP command. If it is not in the current directory, you can use the COUNTRY= statement in the CONFIG.SYS file or the NLSFUNC command to tell MS-DOS where to find COUNTRY.SYS.

Be sure to read Chapter 9, Code Page Switching, for information on code page switching.

If you are running an application program and then give the CHCP command, the program continues to use the original code page. If you start a program after giving the command, it uses the new page code.

If the code page you select is not prepared for the system, the screen displays a message such as this:

```
Code page 863 not prepared for system
```

If the device (a monitor or printer, for example) is not prepared for a code page, the screen displays a message like the following:

```
Code page 863 not prepared for all devices
```

The CHCP command changes the active code page even if the specified code page is not prepared for a device. So if you want to return to the original code page, you need to reenter its number in the CHCP command.

Examples

To display the current code page, type the following and press **Enter**:

```
CHCP
```

If the current code page is the US, the screen displays the following:

```
Active code page: 437
```

To select the multilingual code page, type the following and press **Enter**:

```
CHCP 850
```

CHDIR *Internal*

Purpose
Changes or displays the current directory.

Format
```
CHDIR [d:][path]

CD [d:][path]
```

Description
Use CHDIR to change the current directory to another, or to display the current directory path of a drive. You can type either CHDIR or CD.

The directory you are working in is called your current directory. MS-DOS remembers the current directory for each drive. Therefore, when you change drives without specifying a directory, MS-DOS goes to the directory you were using when you last used that drive.

Unless you set a path, MS-DOS looks in the current directory (on the current drive) to find files. You can set a path of up to 64 characters starting from the root directory. Indicate the root directory with a leading backslash (\).

A single period (.) represents the current directory. Two periods (..) represent the parent directory of the current directory.

Caution
The current directory may be hidden by ASSIGN, SUBST, and JOIN.

Examples
If your current directory is \LEDGER\SALES\WEST and you want to change to the \WORDPROC\BUSINESS directory, type the following and press **Enter**:

```
CD \WORDPROC\BUSINESS
```

To display the current directory, type only CHDIR and press **Enter**. The screen displays your current directory. For example, if your current directory is \WORDPROC\BUSINESS, the screen displays the following:

```
B:\WORDPROC\BUSINESS
```

To change to the parent directory of the current directory (the next directory *up* the tree), type the following and press **Enter**:

```
CHDIR ..
```

To change to the root directory, regardless of what your current directory is, type the following and press **Enter**:

```
CHDIR \
```

CHKDSK *External*

Purpose

Checks the directories, files, and file allocation tables on the specified disk and produces a disk and memory status report.

Format

`[d:][path]CHKDSK [d:][path][filename][/F][/V]`

Description

Use CHKDSK to inspect the status of a diskette or hard disk and report the number of files, the amount of total disk space and space still available for use, and the amount of internal memory available.

Run this command periodically to check for errors. If CHKDSK finds any errors in the disk's directory or file allocation table, it reports them and, optionally, corrects them.

Note

An easier way to use the CHKDSK command is through the MENU utility. See Chapter 5 for instructions.

You can specify a filename and CHKDSK will report the number of non-contiguous areas occupied by the file (or all the files if you specify *.*).

CHKDSK assumes that the disk to be checked is in the specified drive. You are not prompted to insert the disk. If you have a dual diskette drive system, be sure to specify drive B as the drive to be checked. (On a single diskette drive system, MS-DOS prompts you to insert the B diskette.)

You can use two switches with CHKDSK:

Switch	*Function*
/F	Selects fix mode and CHKDSK attempts to correct any errors
/V	Selects verify mode and CHKDSK displays filenames, directories, and messages while it is running

CHKDSK *d:*>*filename* redirects the output from CHKDSK to a file and sends status information and errors to the specified filename. If you also include the /V switch, CHKDSK outputs the filenames and messages to the file.

Do not use the /F switch if you redirect the output to the same disk drive. The addition of a new filename to the directory would automatically cause an error.

Cautions

Do not use CHKDSK on drives specified in a SUBST or JOIN command.

This command may not work in a network environment.

Examples

To check the disk in drive B, type the following and press Enter:

```
CHKDSK B:
```

If CHKDSK does not find any errors, you see a status report similar to this:

```
Volume SALES     created Feb 17, 1988 9:30a
362496 bytes total disk space
71680 bytes in 7 user files
290816 bytes available on disk

655360 bytes total memory
589264 bytes free
```

To check the disk in drive A and display all the files and their paths, type the following and press **Enter**:

```
CHKDSK A:/V
```

You see a status report like the one above plus a display of all the files and their paths.

To determine the number of non-contiguous areas, if any, occupied by the file BUSINESS in your current directory, type the following and press **Enter**:

```
CHKDSK BUSINESS
```

If the file contains non-contiguous areas, CHKDSK displays the following message:

```
B: \BUSINESS
     Contains 2 non-contiguous blocks
```

CLS

Internal

Purpose

Clears the monitor screen.

Format

```
CLS
```

Description

Use CLS to clear your monitor screen. MS-DOS clears your screen and displays the command prompt in the upper left corner of the screen.

If you have loaded ANSI.SYS and have set screen attributes, the CLS command does not change the attributes.

Example

On a screen filled with text, type the following and press Enter:

```
CLS
```

Your screen clears and displays only the command prompt.

COMMAND *External*

Purpose

Loads a secondary command processor.

Format

```
[d:][path]COMMAND [d:][path][CTTY-dev]
                  [/C command][/E:nnnnn][/P]
```

Description

If you have loaded a top-level command processor in place of COMMAND.COM, use COMMAND to load a secondary command processor.

When you boot MS-DOS, COMMAND automatically loads, but it loads in parts. One part remains in memory permanently. Another part is transient.

The space in memory that the transient part occupies is not reserved and application programs are permitted to overwrite it. Therefore, programs sometimes have to reload this transient part.

If COMMAND.COM is not found in the specified directory, MS-DOS searches the path in your environment. COMMAND.COM loads the transient portion from the file specified in COMSPEC= as part of its initialization.

If you enter COMMAND without any parameters, MS-DOS loads a new copy of the command processor. This new copy inherits the environment known to the previous level of the command processor.

If you use the SET command to change the environment of the secondary command processor, only the secondary copy recognizes the change. If you exit back to the primary command processor, it returns to the environment of the primary command processor that was in effect before the secondary copy existed.

You can use the CTTY-*dev* parameter to select a different device (such as AUX) for input and output. See the description of CTTY later in this chapter for more information.

You can use the following switches with COMMAND:

Switch	*Function*
/C *command*	Allows you to enter a command and then automatically exit back to the primary command processor after the command is completed. /P is ignored if you use /C. You send *command* to the command processor. The command is interpreted and executed as if you had typed it at the system prompt.
/E:*nnnnn*	Specifies a base 10 integer and indicates the number of bytes to set the environment size. This number must be between 160 and 32768. It is rounded up to the nearest paragraph boundary (a multiple of 16 bytes).
/P	Causes the copy of the new command processor to become permanent in memory and it remains active until you turn off or reboot the system. The second command processor does not return to the primary command processor. You must restart MS-DOS to remove the second command processor. If you use /C, /P is ignored. Without the /P switch, the secondary processor remains resident until you give the EXIT command. If you use the /P switch, the EXIT command does not work.

Examples

To load a secondary command processor and have it execute the DIR command (for drive B), and then exit back to the primary command processor, type the following and press **Enter**:

```
COMMAND /C DIR B:
```

To load a new command processor with an environment size of 100 paragraphs and cause it to become permanent in memory, type the following and press **Enter**:

```
COMMAND /E:16ØØ /P
```

COMP

External

Purpose

Compares the contents of one file or group of files to another.

Format

```
[d:][path]COMP [d:][path][filename]
               [d:][path][filename]
```

Description

The COMP command compares single files or groups of files by examining each byte of information. The files can be in the same directory or in different directories on the same or on different disks.

Note

Use COMP if you just want to know if the files are the same. If you want more detailed information about the files, you may prefer to use the FC command.

If you do not enter any parameters in the command, COMP displays prompts on the screen for information about the two files to be compared.

If the files you want to compare are not on the same disk as COMP, type the COMP command without any parameters. The program then prompts you for the filenames, and you can insert the proper diskette.

If the two files to be compared are not the same size, COMP displays the following prompt and stops the comparison:

```
Files are different sizes

Compare more files (Y/N)?
```

You cannot compare two files that are not the same size.

When the program finds bytes that do not match, it displays a message such as the following.

```
Compare error at OFFSET 10
File 1 = 48

File 2 = 71
```

This error message gives the hexadecimal location (the offset) and the value of bytes that do not match. After finding 10 unequal comparisons, COMP quits and displays this message:

```
10 Mismatches - ending compare
```

If the files are identical, COMP displays this message:

```
Files compare ok
```

If you are comparing more than two files, the next pair matching the filename specification are compared. When COMP finishes comparing all the specified files, it displays this message:

```
Compare more files (Y/N)?
```

Press **Y** if you want to compare more files—the program prompts you to enter the filenames, etc.—or press **N** to exit the program.

For all comparisons, COMP looks at the last byte of the files to verify that they contain a valid end-of-file mark (Ctrl Z). If it does not find this mark for a file, COMP displays this message:

```
Eof mark not found
```

Examples

To compare all files with the extension .TXT on drive A with files on drive B with the same names, type the following and press **Enter**:

```
COMP A:*.TXT B:
```

To compare a file named JUNEMEMO with a file named JULYMEMO in the WORDPROC directory on drive C, type the following and press **Enter**:

```
COMP C:\WORDPROC\JUNEMEMO  C:\WORDPROC
   \JULYMEMO
```

COPY

Internal

Purpose

Copies one or more files to the same or to another disk and optionally renames or merges them.

Format

```
COPY [d:][path]filename [d:][path][filename]
     [/A][/B][/V]

COPY [d:][path]filename +
     [[d:][path]filename[...]]
     [d:][path]filename[/A][/B][/V]

COPY [d:][path]filename +,,
```

Description

There are several ways to use the COPY command to copy files. You can do any of the following:

- Copy individual files from one disk to another or to the same disk
- Copy a group of files using wildcard characters
- Copy one or more files under new names
- Copy files to any system device
- Combine or merge files into one file with each file starting at the end of the preceding file.

If you want to copy files including subdirectories, use either the BACKUP or XCOPY command. COPY only copies files from the current or specified directory.

To copy files—In the first COPY format above, the first file specification is the source file and the second one is the destination file. If the source and destination files are in the current directory, you need not specify a complete path; simply specify the filenames.

The source file and the destination file must either be on different directories or have different names. If you try to copy a file without specifying a different directory or a different filename for the destination file, the copy stops and the screen displays an error message.

`COPY d1:path\filename d2:` copies the original file to the drive you designate and retains the original filename.

`COPY d:path\filename1 filename2` copies the original file to a file on the default drive, using the new filename you specify.

`COPY d:path\filename1 d:filename2` copies the original file to the drive and filename you specify.

`COPY d:path\filename device` copies a file to a device. Use this format to print a file on the printer, send commands to the printer, or to transfer data to any system device.

You can use the wildcard characters to copy groups of similar files. The command `COPY *.TXT B:` copies all files with the TXT extension from the default drive to the disk in drive B.

You can use three switches with COPY:

Switch	*Function*
/A	Selects ASCII (text) mode
/B	Selects Binary (program) mode
/V	Selects Verify mode

The /A and /B switches apply to the file specification immediately preceding it and to all remaining file specifications on the command line, until you enter another /A or /B switch. You can enter the /A and /B switches before the first filename.

Use /V to select Verify mode. MS-DOS then verifies that the sectors are recorded properly during the COPY process. This is the same check that results from the VERIFY ON command. However, /V is effective only during the specified COPY command.

Use /A to select ASCII mode, which indicates that you are processing ASCII, or text, files. When you use /A with a source file specification, the copy includes data but does not include the first end-of-file mark (in EDLIN, this is Ctrl Z). The remainder of the file does not copy. When you specify a destination file, the /A switch adds an end-of-file character as the last character of the file.

Use /B to select Binary mode, which indicates that you are processing binary, or program, files. When you use /B with a source file specification, the copy contains the entire file, including any end-of-file mark. When you specify a destination file, the /B switch does not add an end-of-file character.

To merge files—Use the second COPY format above to merge files. Type any number of filenames separated by plus signs (+). For example, the following command combines three files into a new file called *newfile*:

```
COPY file1+file2+file3 newfile
```

You can use wildcards to combine several files. The command `COPY *.ext newfile` combines all files with the specified extension into a file called *newfile*.

You can also use wildcards and file extensions to combine the files and create additional files.

To update without copying—Use the third COPY format above to update the date and time of the file without copying it anywhere:

```
COPY filename +,,
```

Caution

Do not try to merge files if one of the source filenames has the same extension as the destination. For example, if ALL.LST already exists, do not use the command `COPY *.LST ALL.LST`. MS-DOS overwrites the original ALL.LST on the destination diskette and detects this error only when the copy is complete.

Examples

To copy all files from drive A to drive B, type the following and press **Enter**:

```
COPY A:*.* B:
```

To copy all .TXT files in the specified path to the root directory of the hard disk, type the following and press **Enter**:

```
COPY A:\WORDPROC\BUSINESS\INTERNAL\*.TXT
       C:\
```

To copy the file 620.TXT (in the \ELECMAIL\IN directory) to the \WORDPROC\PERSONAL directory, type the following and press **Enter**:

```
COPY \ELECMAIL\IN\62Ø.TXT \WORDPROC
     \PERSONAL
```

To print the textfile EPSON.TXT on your printer, type the following and press **Enter**:

```
COPY A·EPSON.TXT PRN
```

To update the date and time of the textfile STATUS.TXT without copying it, type the following and press **Enter**:

```
COPY STATUS.TXT +,,
```

CTTY

Internal

Purpose

Changes the input/output device.

Format

CTTY *device*

Description

Use CTTY to change the device you are using. You can direct input and output to the following devices:

Device	*Description*
AUX	An auxiliary device, such as a printer or disk drive connected to the RS-232C serial port
CON	The console, which represents input from the keyboard and output to the monitor screen
PRN	A printer connected via the printer port
NUL	A non-functional device (useful during program development)
LPT1	Line printer 1, the same as PRN
COM1	Communications port 1, which is your serial port, the same as AUX

You can specify LPT2, LPT3, and COM2, COM3, and COM4 as long as that device is installed in or connected to the system.

You can use printers as output devices only. You cannot use a printer for input.

Caution

Once you use CTTY, input is no longer accepted from the keyboard and you would have to reset the computer. Therefore, use the CTTY command in a batch file. Remember to include CTTY CON at the end of your batch file to return control to the keyboard.

Examples

To direct all command output from the current device (the keyboard), to the AUX port (which may be a printer), type the following and press **Enter**:

```
CTTY AUX
```

To direct all command input and output back to the keyboard and monitor, type the following and press **Enter**:

```
CTTY CON
```

Here is an example of a batch file you can create, directing output to the printer and then back to the screen:

```
REM This is printed on the screen.
CTTY PRN
REM This is output to the printer.
CTTY CON
REM This is output to the screen again.
```

With CTTY, you can use your computer as a terminal for another computer. Connect the two computers via the RS-232C serial port (device name AUX), and make sure the signal parameters match properly with the MODE command. Then use the command CTTY AUX to input and output all commands from the other computer. The command CTTY CON, entered from the other computer, moves all command output back to the keyboard of your computer.

DATE

Internal

Purpose

Displays and/or sets the system date.

Format

DATE [*mm-dd-yy*]

DATE [*dd-mm-yy*]

DATE [*yy-mm-dd*]

Description

Whenever you create a new file or alter an existing one, MS-DOS records the date and time with that file in its directory. You can use the DATE command to display the current date or set a new date for the system. The file directory then records this date on all files that are created or modified.

This command updates the CMOS date if your computer contains a real-time clock.

You can display the current system date by typing DATE and pressing **Enter**. If you are using the United States country code, a message similar to this appears:

```
Current date is Tue 3-15-88
Enter new date (mm-dd-yy):_
```

For other countries, the month and day are reversed or the year may come first. (The way the current date displays depends on which COUNTRY command is included in the CONFIG.SYS file. United States is the default setting.)

Press **Enter** if you do not want to change the current date. Or, enter a new date and then press **Enter**. MS-DOS returns to the command prompt.

Enter the date using numbers only. You need not enter the day of week. The numbers must be in the following ranges:

- *mm* must be from 1 to 12
- *dd* must be from 1 to 31
- yy must be from 80 to 99 or from 1980 to 2099.

You can separate the month, day, and year entries with hyphens (-), slashes (/), or periods (.).

MS-DOS updates months and years correctly, whether the month has 31, 30, 29, or 28 days. MS-DOS also accommodates leap years.

Examples

To set the date for April 20, 1988, you can type any one of the following (using the U.S. format):

```
4/20/88          04/20/88
4/20/1988        04/20/1988
4-20-88          04-20-88
4-20-1988        04-20-1988
```

If you have used the COUNTRY = United Kingdom in the CONFIG.SYS file, you would type the date in one of these formats:

```
20/4/88
20-4-1988
20.4.88
```

DEL

Internal

Purpose

Deletes a file or group of files.

Format

DEL [*d:*][*path*]*filename*

Description

Use DEL to delete one or more files. (You can type ERASE instead of DEL.)

DEL *filename* deletes the specified file from the current directory.

You can use the wildcard characters (?and *) to delete groups of similar files. The command DEL *.*ext* deletes all files with the specified extension from the current directory on the default drive.

You can delete all files from a directory or disk by using wildcard characters for the filename and extension. Type DEL *.* and you see this prompt:

```
Are you sure (Y/N)?
```

Press Y and Enter to delete all files in the current directory. Press N and Enter to cancel the DEL command.

If you enter a pathname but no filename in the command, MS-DOS assumes you want to delete all the files in the specified path. Since this is the same as entering *.*, you see the same prompt and have an opportunity to cancel the command.

DEL and ERASE delete files only. You cannot delete a directory with these commands. To delete a directory, use the RMDIR command.

You cannot delete a file that is marked as read-only.

Cautions

Be sure you no longer need a file before you delete it.

Be careful when using DEL after using ASSIGN, JOIN, or SUBST.

Examples

To delete the file SEEME from the current directory on the default drive, type the following and press **Enter**:

```
DEL SEEME
```

To delete all files on drive B with a .BAK extension, type the following and press **Enter**:

```
DEL B:*.BAK
```

To delete a file named JUNSALES from the subdirectory EXTERNAL (in the \WORDPROC\BUSINESS\EXTERNAL directory) on drive C, type the following and press **Enter**:

```
DEL C:\WORDPROC\BUSINESS\EXTERNAL\JUNSALES
```

DIR

Internal

Purpose

Lists the files in a directory.

Format

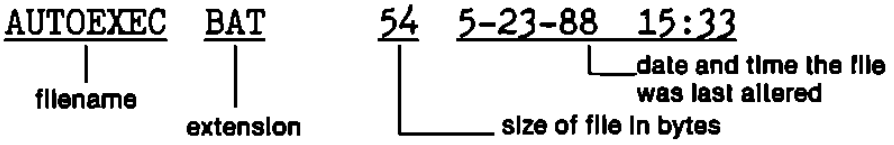
```
DIR [d:][path][filename][/P][/W]
```

Description

Use DIR to display a list of the files in a directory. You can display the entire directory or a portion of the directory.

The information DIR displays includes the filename and extension, the size (in bytes), and the date and time the file was last modified. The directory listing also displays the volume identification and the amount of free space left on the disk.

The following is an example of how a DIR command displays a file named AUTOEXEC.BAT:



Note that the format for date and time is dependent on the COUNTRY command set in your CONFIG.SYS file. See Chapter 6, Configuring Your System, for information on the CONFIG.SYS file.

Directory names are identified by ⟨DIR⟩ in the file size field.

You can use the wildcard characters ? and * in the filename. For example, the following DIR commands are equivalent:

Command	*Equivalent*
DIR	DIR *.*
DIR LETTER	DIR LETTER.*
DIR .INV	DIR *.INV

You can specify two switches with DIR:

Switch	*Function*
/P	Selects Page mode. The directory display pauses when the screen is full; press any key to display the next screen.
/W	Selects Wide display. The screen displays five filenames per line but no other file information. Use this switch for 80-column displays only.

Examples

To list all files and any subdirectories in the current directory on the default drive one screen page at a time, type the following and press **Enter**:

```
DIR /P
```

To list all files and directories on drive B, type the following and press **Enter**:

```
DIR B:
```

To list all the files in the SALES directory on the default drive, type the following and press **Enter**:

```
DIR \SALES
```

To list a file named DEVST.MT on drive A, type the following and press **Enter**:

```
DIR A:DEVST.MT
```

To list all files with a .COM extension in wide display, type the following and press **Enter**:

```
DIR *.COM /W
```

To list all files in the current directory whose names begin with MEMO followed by a single character that varies, type the followiong and press **Enter**:

```
DIR MEMO?
```

DISKCOMP

External

Purpose

Compares the contents of two diskettes.

Format

`[d:][path]DISKCOMP [d1:[d2:]][/1][/8]`

Description

Use DISKCOMP to compare sectors on one diskette with those on another diskette. An examination by sector tells whether the diskettes are exactly alike. Use DISKCOMP with diskettes only. You cannot compare a diskette to a hard disk.

Note

Use this command to compare entire diskettes. To compare files, use the COMP or FC command. You can also compare diskettes using the Epson MENU utility. See Chapter 5 for instructions.

The order in which you specify drives sets the order for reading and comparing. The diskette in the first drive you specify is read, then DISKCOMP compares the contents of the diskette in the second drive to those of the first. DISKCOMP then reports at which points the second diskette fails to match the first.

For example, `DISKCOMP A: B:` compares the diskette in drive A (the first disk) with the diskette in drive B (the second disk), displaying on the screen any differences on the second diskette.

If you are logged onto a hard disk drive, you must include both drive descriptors in the command, even if you have only one diskette drive.

If you are logged onto a diskette drive and specify only one drive, DISKCOMP reads the diskette in the specified drive first and then compares it to the disk in the default drive. For example, if you are logged onto drive A, typing `DISKCOMP B:` compares the diskette in drive B to the diskette in drive A, showing possible differences between the two diskettes.

Note
The disks you are comparing must be of the same type. You cannot, for example, compare a 360KB diskette to a 1.2MB diskette or a 720KB diskette to a 360KB diskette.

If you do not include any drive specifications, DISKCOMP performs its comparison using only the default drive, prompting you to insert diskettes one at a time in that drive. DISKCOMP compares the second diskette you insert to the image read from the first and reports the differences. Use this procedure if your system has only one diskette drive.

You can use two switches with DISKCOMP:

Switch	*Function*
/1	Compares only one side of each diskette; use for single-sided diskettes only
/8	Compares only the first eight sectors per track on your diskettes; use for diskettes originally formatted in eight sectors per track

DISKCOMP is very handy anytime you want to know the similarity of two diskettes. You can also use it to check the success of a DISKCOPY operation.

DISKCOMP automatically determines the number of sides and sectors per track to compare. The first drive specified determines the type of comparison that is performed.

Batch files using DISKCOPY can also use DISKCOMP. Other batch files dealing with diskette housekeeping can make frequent use of this comparison command. Your own operating needs determine just how you use DISKCOMP.

Note
If you compare a diskette with a backup version you made using the COPY command, you may receive an error message even though the two diskettes contain the exact same files. This happens because although COPY copies the files exactly, they may not be stored in the same sectors on the two diskettes. The diskettes are identical if you use the DISKCOPY command to make the backup copy.

Cautions

If you have used ASSIGN to reassign disk drive descriptors, DISKCOMP may not work properly. Cancel the assignments and then run DISKCOMP.

Do not use DISKCOMP on any drives that are being used in a SUBST or JOIN command.

This command may not work in a network environment.

Examples

To compare the diskette in drive B to the one in drive A, type the following and press **Enter**:

```
DISKCOMP A: B:
```

After DISKCOMP loads, it displays the following screen prompts:

```
Insert FIRST diskette in drive A:
Insert SECOND diskette in drive B:
Press any key when ready...
```

Put your first diskette in drive A and your second one in drive B. Press any key to continue.

DISKCOMP reads the format of the particular diskette being checked. For a 360KB diskette, the screen displays the following:

```
Comparing 40 tracks 9 sectors per track, 2
side(s)
```

If DISKCOMP detects any differences, the screen reports each of them by track and side. For example:

```
Compare error on side 1 track 4
```

If DISKCOMP does not find any differences between your diskettes, it reports:

```
Compare OK
```

When the comparison is complete, your screen displays:

```
Compare another diskette (Y/N)?
```

Press **Y** to repeat the procedure, or **N** to exit to the command prompt. If you do repeat the procedure, remember that the same drive order applies in your next comparison.

DISKCOPY *External*

Purpose

Copies the contents of one diskette to another.

Format

```
[d:][path]DISKCOPY [d1:[d2:]][/1]
```

Description

Use DISKCOPY to copy the contents of the diskette in the source drive to the one in the destination drive. If you enter `DISKCOPY A: B:`, the source drive is A, and the destination, or target, drive is B.

Use DISKCOPY to copy diskettes only. You cannot use it to copy a diskette to a hard disk or any portion of the hard disk to a diskette.

Use this command to copy entire diskettes. To copy files, use the COPY command.

Note

An easier way to use the DISKCOPY command is through the MENU utility. See Chapter 5 for instructions.

You can specify the same drive as your source and destination drive, or you can specify different drives. When the source and destination drives are the same, MS-DOS performs a single-drive copy operation. DISKCOPY prompts you to insert the diskettes at the appropriate times and waits for you to press any key before continuing.

If you copy a 360KB diskette in a 1.2MB drive, you may have trouble reading that diskette in a 360KB drive later. Read "Drive and diskette incompatibilities" in Chapter 1 for more information.

When the copy operation begins, you see this message when copying a 1.2MB diskette:

```
Copying 80 tracks
9 Sectors/Track, 2 Side(s)
```

DISKCOPY then checks to see if the destination diskette is formatted and in the same format as the source disk. If not, DISKCOPY formats the diskette. You see this message:

```
Formatting while copying
```

When the copy is complete, you see this message:

```
Copy another diskette (Y/N)?
```

Press **Y** to make another copy on the same drives. Press **N** to end the DISKCOPY command.

Notice that the disk drive descriptors are optional as long as the default drive is not the hard disk. If you omit both, the current drive conducts a single-drive copy operation. If you omit the second disk drive descriptor, the current drive is also the destination drive. You cannot give the DISKCOPY command without drive descriptors if you are currently logged onto the hard disk drive.

Usually, DISKCOPY automatically determines the number of sides per diskette to copy, based on the source drive and diskette. For some applications, however, you must use /1 to perform a single-sided DISKCOPY.

Cautions

Diskettes become fragmented when you create and delete a lot of files. This is because diskette space is not allocated sequentially. The first free sector found is the next sector allocated, regardless of its location.

A fragmented disk can cause poor performance due to delays involved in finding, reading, or writing a file. To eliminate fragmentation, use the COPY command or XCOPY—instead of DISKCOPY—to copy your diskette.

If you have reassigned disk drive descriptors with ASSIGN, cancel the assignments before you run DISKCOPY. Otherwise, you could destroy data.

Do not use DISKCOPY on any drives that are being used in a SUBST or JOIN command.

This command may not work in a network environment.

If you copy to a 360KB diskette in 1.2MB drive, you may have trouble reading the diskette in a 360KB drive.

To copy the contents of a 360KB diskette to a 1.2MB high-density diskette or from a 720KB diskette to a 1.44MB diskette, use the COPY command.

Example

To copy two diskettes of the same type with a dual drive system, place the source diskette in drive A and the target diskette in drive B. Then type the following and press **Enter**:

```
DISKCOPY A: B:
```

ERASE *Internal*

Purpose
Erases a file or group of files.

Format
ERASE [*d:*][*path*]*filename*

Description
Use ERASE to erase (delete) one or more files. (You can type DEL instead of ERASE.)

ERASE *filename* erases the specified file from the current directory.

You can use the wildcard characters (? and *) to erase groups of similar files. The command ERASE *.*ext* erases all files with the specified extension from the current directory on the default drive.

You can erase all files from a directory or disk by using wildcard characters for the filename and extension. Type ERASE*.* and you see the prompt:

```
Are you sure (Y/N)?
```

Press **Y** and **Enter** to erase all files in the current directory. Press **N** and **Enter** to cancel the ERASE command.

If you enter a pathname but no filename in the command, MS-DOS assumes you want to erase all the files in the specified path. Since this is the same as entering *.*, you see the same prompt and have an opportunity to cancel the command.

ERASE and DEL erase files only. You cannot erase a directory with these commands. To erase a directory, use the RMDIR command.

You cannot erase a file that is marked as read-only.

Cautions
Be sure you no longer need a file before you erase it.

Be careful when using ERASE after using ASSIGN, JOIN, or SUBST.

Examples

To erase a file named MEMO in the current directory, type the following and press **Enter**:

```
ERASE MEMO
```

To erase all files on drive B with a .BAK extension, type the following and press **Enter**:

```
ERASE B:*.BAK
```

To erase all files from the BUSINESS subdirectory under the WORDPROC directory on drive C, type the following and press **Enter**:

```
ERASE C:\WORDPROC\BUSINESS
```

EXIT *Internal*

Purpose
Exits the command processor and returns to an application program.

Format
```
EXIT
```

Description
Use EXIT to exit to the command processor, COMMAND.COM, and return to an application program.

When you are running an application program, you may want to return to the command processor to perform some function. After performing the function, use the EXIT command to return to the program.

If you have loaded a secondary command processor (with COMMAND), use EXIT to return to the original command processor.

Note
If you used the /P switch when giving the COMMAND command, EXIT does not work.

You can use this command only if you are running an application program that supports it. A number of application programs do so.

Example
To format a diskette in B while in a program that allows you to exit:

1. Leave the program using the appropriate command for the temporary exit.
2. Change the current drive and directory to the one that contains FORMAT.COM (unless you have set the appropriate path).
3. Type `FORMAT B:` and press **Enter**.
4. When the command prompt reappears, type `EXIT` and press **Enter** to return to the application program.

FASTOPEN

External

Purpose

Speeds up access to frequently used files and directories on a hard disk.

Format

```
[d:][path]FASTOPEN d:[=nnn]...
```

Description

FASTOPEN monitors the location of files and directories on a hard disk, enabling MS-DOS to find your files faster. This is especially useful for complex directories or when you run application programs that require several files to work.

Every time you access a directory or open a file, FASTOPEN records its name and location in a list in memory. Then, the next time you access that directory or file, MS-DOS locates it faster because it does not need to search for it.

FASTOPEN works only on hard disks and does not work over a network. You can use the program on up to four hard disks at a time. Repeat the *d:=nnn* format for each drive you want FASTOPEN to monitor.

You can give the FASTOPEN command only once after you load MS-DOS; so be sure to include all the drives you want affected in the first command. If you need to change any of the settings, reload MS-DOS and reenter the command. You may want to include FASTOPEN in your AUTOEXEC.BAT file.

The *nnn* is the number of files per disk you want FASTOPEN to keep track of. The number can be from 10 through 999. If you do not enter a number, the default is 10.

FASTOPEN requires approximately 40 bytes of memory for each file or directory it monitors.

Example

To track the location of 150 files on drive C:, type the following and press **Enter**:

```
FASTOPEN C:=150
```

FC

External

Purpose

Compares files on your disk.

Format

```
[d:][path]FC [/A][/B][/C][/L][/N][/T][/W][/LB n]
        [/n][d:][path]filename1 [d:][path]filename2
```

Description

Use FC to compare two files on your disk if you want to know exactly where they are different. You can output any differences between the two files to the monitor or to a third file.

Note

If you just want to know if two files are different, you may prefer to use the COMP (compare) command. It is simpler but does not provide the detailed information that FC produces. An easier way to use the FC command is through the MENU utility. See Chapter 5 for instructions.

You can compare either text files or binary files. Text files are files containing ASCII data. Binary files are those output by the MACRO-86 assembler, the MS-DOS LINK utility, or by a Microsoft high-level language compiler.

FC compares files in one of two ways: on a line-by-line or on a character-by-character basis. A line-by-line comparison isolates blocks of lines that are different between the two files and prints those blocks. A character-by-character comparison shows the characters that are different between the two files in hexadecimal value.

When comparing binary files, FC displays all bytes that differ. When comparing ASCII files, FC displays the lines that differ unless the number of consecutive lines that differ exceed the size of the internal buffer.

You can use the following switches with FC:

Switch	*Function*
/A	Abbreviates the output of an ASCII comparison
/B	Forces a binary comparison
/C	Does not distinguish between uppercase and lowercase letters
/L	Forces an ASCII comparison
/N	Displays line numbers for an ASCII comparison
/T	Compresses tabs; normally tabs are expanded to 8 spaces
/W	Compresses tabs and spaces
/LB *n*	Sets the internal line buffer to *n* lines
/*n*	Allows you to specify the number of consecutive lines to match; the default is 2

When you use /A, only the beginning and ending lines of each set of differences are displayed. Intermediate lines are represented by ellipses (...).

Use /B to force a binary comparison of both files. This switch is used automatically when you compare .EXE, .COM, .SYS, .OBJ, .LIB, or .BIN files. The two files are compared byte-to-byte, with no attempt to resynchronize after a mismatch. The mismatches print as follows:

```
-ADDRS--F1--F2-
xxxxxxxx yy zz
```

In this example, *xxxxxxxx* is the relative address in hex of the pair of bytes from the beginning of the file. Addresses start at 00000000. The mismatched bytes are *yy* and *zz* from *file1* and *file2*, respectively. If one of the files contains less data than the other, a message appears. For example, if *file1* ends before *file2*, then the following message is displayed:

```
*** File2 longer than file1 ***
```

Use /C to ignore the case of letters so FC treats uppercase and lowercase letters as equals. Only use /C in source comparisons. With /C set, these lines are a match:

```
Much_MORE_data_IS_NOT_FOUND
much_more_data_is_not_found
```

Use /L to compare ASCII files. This switch is used automatically when you compare any non-system files; that is, any files without the .EXE, .COM, .SYS, .OBJ, .LIB, or ,BIN extensions.

Use /N to display line numbers on an ASCII comparison.

Use /T to compress tabs and use /W to compress both tabs and spaces during the comparison. Only use /W in source comparisons. With /W set, FC views multiple, contiguous blanks in any line as a single space. Note that although FC compresses blanks, it does not ignore them. The two exceptions are beginning and ending blanks in a line, which FC does ignore. For example (the underscores represent blanks), FC sees all but the fourth line as matches:

```
____More__data_to_be_____found_______
More_data_to_be_found
_________More_______data_to_be_____found_________
_____Moredata_to_be_found
```

If you specify both the /W and /C switches, then FC compresses blanks and ignores case. For example, these two lines match:

```
____DATA_was_found_____
data_was_found
```

Use /LB *n* to set the size of the internal line buffer. The default length is 100 lines. If the two files have more than this number of consecutive differing lines, FC aborts.

Use /*n* to specify the number of lines that must match for FC to consider the files a match after it finds a difference. If you don't specify this switch, it defaults to two. Use this switch only in source comparisons.

If the files are identical, FC completes the comparison and the command prompt reappears on the screen. No message appears.

If the files are not identical, FC reports the differences between the two files you specify by displaying the first filename, the first line that matches, then the lines that differ between the files, and finally, the last line to match in both files. FC then displays the name of the second file along with the first and last line that match. The default for the number of lines to match between the files is two. (To change this default, specify the number of lines with the */n* switch.) FC continues to list each difference. FC then returns to the MS-DOS command prompt.

FC displays the differences and matches between the two files you specify on your screen unless you redirect the output to a file. Use the greater-than symbol (>) to redirect output to the printer or to a file. The following command compares File1 and File2, and sends the output to DIFFER.TXT on the default drive:

```
FC File1 File2 >DIFFER.TXT
```

Examples

To understand how FC compares differences, you could store these two ASCII files on disk:

ALPHA.ASM	*BETA.ASM*
A	A
B	B
C	C
D	G
E	H
F	I
G	J
H	1
I	2
M	P
N	Q
O	R
P	S
Q	T
R	U
S	V
T	4
U	5
V	W
W	X
X	Y
Z	Z

To compare the two files and display the differences on the screen, type the following and press **Enter**:

```
FC ALPHA.ASM BETA.ASM
```

FC does not compress blanks and does not ignore case. Here, two lines must be the same to constitute a match.

The screen displays the following (the notes do not appear):

```
***** ALPHA.ASM
C                          Note: ALPHA file contains CDEFG,
D                                BETA contains CG.
E
F
G
***** BETA.ASM
C
G
*****

***** ALPHA.ASM
I                          Note: ALPHA file contains IMNOP
M                                where BETA contains IJ12P.
N
O
P
***** BETA.ASM
I
J
1
2
P
*****

***** ALPHA.ASM
V                          Note: ALPHA file contains VW
W                                where BETA contains V 45W.
***** BETA.ASM
V
4
5
W
*****
```

You can print the differences on the printer using the same two source files. In this example, four successive lines must be the same to constitute a match. Type the following and press **Enter**:

```
FC /4 ALPHA.ASM BETA.ASM )PRN
```

The following is output to the printer:

```
***** ALPHA.ASM
C
D
E
F
G
H
I
M
N
O
P
***** BETA.ASM
C
G
H
I
J
1
2
P
*****

***** ALPHA.ASM
V
W
***** BETA.ASM
V
4
5
W
```

Note: P is the first of a string of 4 matches.

Note: W is the first of a string of 4 matches.

The /B switch in the next example forces a binary comparison. You must type this switch and any other before the filenames in the FC command line.

To force a binary comparison and display the differences on the monitor using the same two source files, type the following and press **Enter**:

```
FC /B ALPHA.ASM BETA.ASM
```

The screen displays the following:

```
00000009 44 47
0000000C 45 48
0000000F 46 49
00000012 47 4A
00000015 48 31
00000018 49 32
0000001B 4D 50
0000001E 4E 51
00000021 4F 52
00000024 50 53
00000027 51 54
0000002A 52 55
0000002D 53 56
00000030 54 34
00000033 55 35
00000036 56 57
00000039 57 58
0000003C 58 59
0000003F 59 5A

fc: ALPHA.ASM longer than BETA.ASM
```

You can specify a path to locate the files you want to compare. For example:

```
FC B:\WORDPROC\BUSINESS\BLUE.TXT
   \WORDPROC\BUSINESS\BLUE.BAK
```

In this case, FC compares BLUE.TXT in the \WORDPROC\BUSINESS directory of drive B with BLUE.BAK in the same directory.

FDISK *External*

Purpose

Creates one or more partitions on a hard disk.

Format

`[d:][path]FDISK`

Description

Use FDISK to partition a hard disk so it can run the operating system(s) you want to use. (FDISK stands for "fixed disk," which is another term for hard disk.) You can divide your hard disk into as many as four separate partitions to run four operating systems. If you are using only MS-DOS, you need only one partition.

Use FDISK to do any of the following:

- Create a primary MS-DOS partition
- Create an extended MS-DOS partition
- Create logical drives within an extended MS-DOS partition
- Change an active partition
- Delete an MS-DOS partition
- Display partition data
- Partition a second hard disk.

WARNING

Use FDISK *before* storing files on a hard disk. If you already have files stored on the hard disk, back up these files first or they will be destroyed. Also, FDISK does not work on drives that have been reassigned by the SUBST or JOIN command.

Checking the Hard Disk for Partitions

Before you can use a hard disk, it must be partitioned and then formatted for MS-DOS. Your dealer may have already partitioned your hard disk and formatted it so it automatically loads MS-DOS when you turn it on. If this is the case, you do not need to run FDISK.

If you are not sure whether your hard disk has already been prepared for use, do the following:

1. Turn on or reset the computer without a system diskette in drive A. If MS-DOS loads automatically on the hard disk, it is both partitioned and formatted, and it contains the MS-DOS system files. If it does not start, the disk may have been partitioned but not yet formatted for MS-DOS; go on to step 2.
2. If MS-DOS does not start, you need to check whether the disk has been partitioned. To do this, place the MS-DOS startup (system) diskette in drive A and press **Ctrl Alt Del** to start MS-DOS.
3. Next, run FDISK and select the Display Partition Information option to see if any MS-DOS partitions exist. (See the instructions below.) If any do exist, the disk has been partitioned. If no partitions exist, follow the instructions below to partition the disk.

Note

After you have partitioned the hard disk, be sure to format it for MS-DOS with the SELECT command or with the FORMAT /S command. For instructions, see the descriptions of these commands later in this chapter.

Starting FDISK

Follow these steps to run FDISK:

1. Insert the diskette containing FDISK in drive A. (This should be the startup diskette.)

2. At the A) prompt, type FDISK and press **Enter**. The screen displays the FDISK Options menu:

```
FDISK Options

Current Fixed Disk Drive: 1

Choose one of the following:

   1. Create DOS Partition
   2. Change Active Partition
   3. Delete DOS Partition
   4. Display Partition Information

Enter choice:[1]

Press ESC to return to DOS
```

   If your computer has more than one hard disk, a fifth option appears on the screen:

```
   5. Select Next Fixed Disk Drive
```

3. Press the number for the option you want and press **Enter**. Then see the instructions below for that option.

Creating an MS-DOS Partition

You must create a DOS partition to run MS-DOS on your computer. But you also can create other partitions on the hard disk. Press **1** on the FDISK Options menu to select the Create DOS Partition option. Press **Enter**. The screen displays the following:

```
Current Fixed Disk Drive: 1

   1. Create Primary DOS Partition
   2. Create Extended DOS Partition
```

If you have created an extended DOS partition, a third option is displayed:

```
   3. Create Logical DOS Drive(s) in the Extended
      DOS Partition
```

You must create a primary MS-DOS partition before you can create an extended MS-DOS partition on the hard disk.

Typically, you need only one MS-DOS partition for your entire hard disk. You may, however, want to create an extended partition to designate one or more logical drives for the disk. Follow the appropriate instructions below for the option you choose.

Note

If your hard disk already contains four partitions and you select option 1 or 2, an error message appears.

Creating the primary DOS partition

Choose option 1 to create the primary MS-DOS partition. You must create a primary DOS partition before you can create an extended partition. If your computer has two hard disks, only the first one *must* have a primary partition; on the second disk, you can create only an extended partition if you wish.

Press **1** and **Enter** to create a primary MS-DOS partition. The screen displays the following:

```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you wish to use the maximum size
for a DOS partition and make the DOS
partition active (Y/N).......? [Y]

Press ESC to return to FDISK Options
```

If you want the primary DOS partition to occupy the largest space available up to 32MB, see "Using the entire hard disk for MS-DOS" below.

If you plan to run another operating system on the hard disk, the MS-DOS partition cannot occupy the entire disk. See "Using part of the hard disk for MS-DOS" below.

Using the entire hard disk for MS-DOS

1. To use the entire hard disk for MS-DOS, press **Y** and **Enter**. The screen displays the following message:

```
System will now restart

Insert DOS diskette in drive A:
Press any key when ready...
```

2. Press any key to restart the system. You do not have to insert any diskettes because the MS-DOS diskette is already in drive A. Your computer reloads MS-DOS and the screen displays the date prompt.

3. Enter the date and time if necessary, or just press **Enter**. The system creates the MS-DOS partition and the `A)` prompt reappears.

Before you can use the MS-DOS partition, you must format it with the SELECT or FORMAT /S command. See the documentation for your hard disk and the command descriptions in this chapter.

This procedure does not use the entire disk if its capacity is greater than 32MB. To use the rest, run FDISK again to create an extended partition.

Using part of the hard disk for MS-DOS

To have more than one partition on the hard disk, with one of them being MS-DOS, press **N** and **Enter** at the Create Primary DOS Partition prompt. The screen displays information such as the following:

```
Total disk space is 977 cylinders.
Maximum space available for partition
is 770 cylinders.

Enter partition size.....[770]

No partitions defined.

Press Esc to return to FDISK options
```

The space available on the hard disk is measured in cylinders, or tracks. This menu shows the total number of cylinders available for a hard disk partition and prompts you to enter the desired size, in cylinders. Any part of this total amount that you do not use for the primary partition can be used for the extended MS-DOS partition or another operating system.

To accept the default maximum value (770 in this case), press **Enter**. To select a different size, type the number and press **Enter**.

When you create the primary partition this way, FDISK does not automatically make the MS-DOS partition active. (When the MS-DOS partition is active, it loads automatically from the hard disk whenever you turn on or reset the computer.) To make the MS-DOS partition active, see "Changing the Active Partition," below.

The procedure creates the primary MS-DOS partition, but you must then do the following before you can load MS-DOS from it:

- Change the active partition.
- Exit the FDISK program.
- Format the MS-DOS partition with the SELECT or FORMAT command.
- Copy the MS-DOS files to the hard disk.

Creating an extended DOS partition

You must create a primary DOS partition before you can create an extended partition. If your computer has two hard disks, only the first one *must* have a primary partition; on the second disk, you can create only an extended partition if you wish.

Choose option 2 from the Create DOS Partition menu to create an extended MS-DOS partition. The screen displays the following:

```
Create Extended DOS Partition

Current Fixed Disk Drive: 1

Partition    Status    Type    Start    End    Size
  C: 1         A     PRI DOS    1      77Ø    77Ø

Total disk space is 977 cylinders.
Maximum space available for partition
is 207 cylinders.

Enter partition size.............: [ 2Ø7]

Press ESC to return to FDISK Options
```

Enter the number of cylinders you want to be the size of the extended partition and press **Enter**. (The maximum size you can make the partition is the number displayed as the maximum space available for the partition.) The screen then displays the status of your primary and extended partitions, for example:

```
Partition    Status    Type    Start    End    Size
  C: 1         A     PRI DOS    1      77Ø    77Ø
     2               EXT DOS   771     977    2Ø7

Extended DOS partition created
```

Press **Esc**. The screen displays the following:

```
No logical drives defined

Total partition size is 2Ø7 cylinders

Maximum space available for logical
drive is 2Ø7 cylinders.

Enter logical drive size.............: [ 2Ø7]

Press ESC to return to FDISK Options
```

See the instructions below to create logical drives in the extended partition.

Creating logical drives in the extended MS-DOS partition

When you create an extended partition, MS-DOS lets you create additional logical drives on that part of the hard disk. You do this by assigning drive letters (from D through Z) to each of the logical drives you want.

To create logical drives in the extended partition, choose option 3 from the Create DOS Partition menu. The screen displays a menu such as the following:

```
Create Logical DOS Drive(s)

No logical drives defined

Total partition space is 328 cylinders.

Maximum space available for logical drive is
328 cylinders.

Enter logical drive size.....[328]
```

You can make the entire partition one logical drive if it is less than 32MB in size or you can divide it into two or more drives. This is useful if you want to isolate a particular application program and its data files in a separate logical area (drive) in the partition.

You should assign all the cylinders in the extended partition to a drive or drives; otherwise you will not be able to access all of the available disk space in the extended partition.

After you have assigned a drive (or drives) for all of the extended partition, FDISK displays this message:

```
All available space in the Extended DOS
partition is assigned to logical drives.
```

Press **Esc** to return to the main FDISK menu. From there, you can restart MS-DOS or select another option.

Changing the Active Partition

Although your hard disk can have as many as four partitions, only one can be *active*. The active partition takes control of your computer each time you turn it on or reset it. If your hard disk has more than one partition, you can choose which one should be active.

A partition can be active only if it contains an operating system. You cannot make an extended MS-DOS partition active. If your computer has two hard disk drives, be sure to place any partition containing an operating system on the first hard disk; a partition on the second drive cannot be active.

1. Press **2** on the FDISK Options menu to select the Change Active Partition option. Press **Enter**.

   The Change Active Partition screen appears. For example, if you have created primary and extended DOS partitions, it might look like this:

```
Change Active Partition

Current Fixed Disk Drive: 1

Partition   Status    Type    Start   End   Size
  C: 1        A     PRI DOS     1     770   770
     2              EXT DOS   771     977   207

Total disk space is 977 cylinders

Enter the number of the partition you
want to make active.............:[ ]

Press ESC to return to FDISK Options
```

   The column headings represent the following:

   Partition—The number assigned to the partition.

   Status—Whether the partition is active (A) or not.

   Type—Whether the partition is a DOS partition or a non-DOS partition.

Start—The starting cylinder number of a partition.

End—The ending cylinder number of a partition.

Size—The partition size measured in cylinders.

2. Type the number of the partition that you want to designate as active and press **Enter**. For example, to make the DOS partition active, press **1** and then **Enter**.
3. Press **Esc** to return to the FDISK Options menu.

Deleting an MS-DOS Partition

FDISK lets you delete an MS-DOS partition you no longer want. (You cannot delete a non-MS-DOS partition with FDISK.)

To delete an MS-DOS partition, select option 3 from the FDISK Options menu. The screen displays the following menu:

```
Delete DOS Partition

Current Fixed Disk Drive: 1

Choose one of the following:

1. Delete Primary DOS Partition

2. Delete Extended DOS Partition

3. Delete Logical DOS Drive(s) in the Extended
   DOS Partition.

Enter choice: [ ]

Press ESC to return to FDISK Options
```

The third option appears only if logical drives exist in the extended partition of MS-DOS.

Press the number of the option you want and press **Enter**. The next menu shows the status of the partition you selected—either the primary or the extended partition. See the instructions below for the option you choose.

Warning
When you delete an MS-DOS partition, FDISK deletes any data stored in that partition, and there is no way to recover that data. So be sure to back up any data you want to keep before you delete a partition.

After you delete an MS-DOS partition, you will not be able to access that part of the hard disk. When you want to run MS-DOS, you will need to insert a system diskette in drive A if you delete the primary partition on the first hard disk. Also, if you want to start a different operating system in another partition, you must change the active partition before you delete the MS-DOS partition.

Deleting the primary MS-DOS partition

When you select option 1 from the Delete DOS Partition menu, the screen displays the following:

```
Delete Primary DOS Partition

Current Fixed Disk Drive: 1

Partition    Status    Type    Start    End    Size
  C: 1         A     PRI DOS     1     770    770
     2               EXT DOS   771     977    207

Warning! Data in Primary DOS
partition will be lost. Do you wish
to continue.............?[N]

Press ESC to return to FDISK Options
```

If you do not want to delete the primary MS-DOS partition, press **N** and **Enter**.

If you do want to delete the primary MS-DOS partition, press **Y** and **Enter**.

The screen displays this message:

```
Primary DOS partition deleted
```

Press **Esc** to return to the FDISK Options menu.

Note
You cannot delete the primary MS-DOS partition on the first hard disk if an extended partition exists on the drive.

Deleting the extended MS-DOS partition

Before you can delete the extended partition, you must delete all the logical drives you have assigned for that partition. (See "Deleting logical drives in the extended partition" below.)

When you select option 2 from the Delete DOS Partition menu, the screen displays partition information such as the following:

```
Delete Extended DOS Partition

Current Fixed Disk Drive: 1

Partition    Status    Type    Start    End    Size
  C: 1          A     PRI DOS    1      770    770
     2                EXT DOS   771     977    207

Warning! Data in Extended DOS
partition will be lost. Do you wish
to continue.............?[N]

Press ESC to return to FDISK Options
```

If you do not want to delete the extended MS-DOS partition, press **N** and **Enter**.

If you do want to delete the extended MS-DOS partition, press **Y** and **Enter**.

The screen displays this message:

```
Extended DOS partition deleted
```

Press **Esc** to return to the FDISK Options menu.

Note
You cannot delete the primary MS-DOS partition on the first hard disk if an extended partition exists on the drive.

Deleting logical drives in the extended partition

Before you delete a logical drive in the extended MS-DOS partition, be sure that there is no data you want to keep stored on the drive. If so, back up the files to diskettes before deleting the drive.

To delete a logical drive in the extended MS-DOS partition, select option 3 from the Delete DOS Partition menu. FDISK displays a menu such as the following:

```
Delete Logical DOS Drive

Drv     Start   End     Size
D:      771     850      80
E:      851     977     127

Total partition space is 207 cylinders.

Warning! Data in the logical DOS drive
will be lost. What drive do you wish
to delete.............? [ ]

Press ESC to return to FDISK Options
```

Press the letter of the drive you want to delete and press **Enter**. FDISK displays the following message:

```
Are you sure.....................? [N]
```

If you are not sure you want to delete the selected drive, press **N** and **Enter**.

If you are sure you want to delete the drive, press **Y** and **Enter**. The information about the specified drive disappears from the screen and the following message is displayed:

```
drive deleted
```

Repeat this procedure for each logical drive you want to delete. Then press **Esc** to return to the FDISK Options menu.

Displaying Partition Data

To display information about how the hard disk is partitioned, select option 4 from the FDISK Options menu. The screen displays information such as the following:

```
Display Partition Information

Current Fixed Disk Drive: 1

Partition    Status    Type    Start    End    Size
  C: 1         A     PRI DOS     1     770    770
     2               EXT DOS   771     977    207

Total disk space is 977 cylinders

The Extended DOS partition contains logical DOS
drives. Do you want to display logical drive
information [Y]

Press ESC to return to FDISK Options
```

If you have an extended partition, press **Y** and **Enter** to display information about that partition:

```
Display Logical DOS Drive(s)

Drv     Start   End     Size
D:      771     850      80
E:      851     977     127

Press ESC to return to FDISK Options
```

Press **Esc** to return to the FDISK Options menu.

Partitioning a Second Hard Disk

If you have a second hard disk, you can use FDISK to partition it and to perform all of the functions described above on the second hard disk.

When the FDISK Options menu is on the screen, press **5** and **Enter** to choose the Select Next Fixed Disk Drive option. (This option is available only if your computer contains more than one hard disk.)

FDISK changes the current fixed drive number to 2 and displays the FDISK Options menu. If you plan to use this disk for MS-DOS, follow the appropriate instructions above.

FIND

External (filter)

Purpose

Searches for a specific string of text within one or more files.

Format

```
[d:][path]FIND [/C][/N][/V] "string"
               [[d:][path]filename...]
```

Description

Use FIND to locate all occurrences of a particular string in a directory or in each of the files you specify. FIND is called a filter because it reads data from a standard input device, filters out the string that matches your specification, and then writes the result to a standard output device. For example, it can display the matching line on your monitor screen.

FIND does not allow wildcards in the filename.

You can use three switches with FIND:

Switch	*Function*
/C	Prints the number of lines that match the string (or that don't match if you use the /V switch)
/N	Precedes each line with its relative line number in the file
/V	Displays all lines that do NOT contain the string

If you include both /C and /N in the command, the /C switch overrides /N.

If you do not enter any switches, FIND displays all lines in the specified file(s) that contain the string.

Type quotation marks around the string. If the text in your string contains quotation marks, type two quotation marks for each occurrence. For example, to find the string She said "Goodbye" and left, type the following:

```
FIND "She said ""goodbye"" and left"
```

FIND locates the exact string of characters you specify, so be sure to type upper- or lowercase letters just as you want to find them. If you type uppercase Y, the program does not find lowercase y. The same rule applies to spaces and punctuation. If FIND does not locate the string you specify in the file or files you list, it displays just the filenames on the screen.

Examples

To display all lines from BOOK1.TXT and BOOK2.TXT (in that order) that contain the string A Day in the Life, type the following and press **Enter**:

```
FIND "A Day in the Life" BOOK1.TXT BOOK2.TXT
```

To display the filenames on drive B that do *not* contain the string DAT, type the following and press **Enter**:

```
DIR B: ¦ FIND /V "DAT"
```

To display all subdirectories of the current directory, type the following and press **Enter**:

```
DIR ¦ FIND "<DIR>"
```

You can include special characters in the string without redirecting input or output.

FORMAT *External*

Purpose

Formats the disk in the specified drive to accept MS-DOS files.

Format

```
[d:][path]FORMAT d:[/B][/S][/V][/1][/4][/8]
                  [/N:nn][/T:nn]
```

Description

Use FORMAT to format your disks for use with MS-DOS.

Note

An easier way to use the FORMAT command is through the MENU utility. See Chapter 5 for instructions.

Formatting initializes the directory and file allocation tables and analyzes the disk for any defective tracks. All new disks must be formatted before you can use them with MS-DOS.

Warning

FORMAT erases any data stored on a disk, so be sure to back up any files you want to keep before you format a disk that contains data.

You can use this command on your hard disk. However, the SELECT command has been designed specifically for formatting the hard disk. On a hard disk, formatting destroys the entire contents of any existing MS-DOS partition, including all subdirectories and files.

You must specify a drive descriptor when you use the FORMAT command. If you do not, you see this message:

```
Drive letter must be specified
```

You can use the following switches with this command. If you do not use any switches, the default parameters for FORMAT are no system files, the maximum available sectors, and two sides.

Switch	*Function*
/B	Reserves space on an 8-sectored diskette for the system files (which you copy later with the SYS command). This switch allows you to place any version of MS-DOS on the diskette; without the /B switch, you can place only version 3.3 on the diskette.
/S	Copies the operating system files from the disk in the default drive to the newly formatted disk.
/V	Causes FORMAT to prompt you for a volume label for the disk you are formatting. A volume label can be up to 11 characters long.
/1	Formats only one side of a 5¼-inch diskette for single-sided use.
/4	Formats a 5¼-inch, 360KB double-density diskette in a 1.2MB high-density drive.
/8	Formats a diskette with 8 sectors per track.
/T:*nn*	Specifies the number of tracks on the diskette to be formatted. Use this switch when you want to format a diskette for less than the maximum capacity supported by the disk drive. For a 360KB diskette, *nn* is equal to 40. For a 720KB or 1.2MB diskette, *nn* is equal to 80 or 40.
/N:*nn*	Specifies the number of sectors per track if you want to format a diskette to use less of the maximum capacity allowed by the disk drive. For a 360KB diskette, *nn* is equal to 9 or 8. For a 1.2MB diskette, *nn* is equal to 15, 8, or 9.

You can use the following switches with the specified disk types:

Disk type	*Parameters allowed*
160/180KB	/B, /S, /V, /1, /4, /8, /N, /T
320/360KB	/B, /S, /V, /1, /4, /8, /N, /T
720KB	/S, /V, /N, /T
1.2MB	/S, /V, /N, /T
1.44MB	/S, /V, /N, /T
Hard Disk	/S, /V

If you use the /S switch, FORMAT copies the operating system files from the disk in the default drive to the target disk. If the system does not have enough memory to store the files, it copies as many as it can to memory, formats the target disk, and then copies the files in memory to the disk. Then it reads the remaining files from the source disk to memory and copies them to the target disk. If you have removed the source diskette from the drive, the program prompts you to reinsert it before continuing.

If you use the /V switch, FORMAT prompts you for a volume label. The label can be up to 11 characters long, and must comply with the same rules defining valid file names. You do not need to type a period (.), however, as you do before an extension to a filename.

The FORMAT program formats the diskette according to the format of the diskette drive and any switches you have entered in the command. If you format a single-sided diskette, be sure to include the /1 switch; otherwise, you will not be able to use the diskette in a single-sided drive.

Do not use the /N or /T parameters if you are formatting the hard disk.

The FORMAT program marks any defective tracks as reserved. These reserved tracks are not allocated to data files.

FORMAT produces a status report that lists the total disk space, defective disk space, space allocated to MS-DOS system files, and the amount of space available for your files.

Formatting a hard disk

If you want to use the FORMAT program to format a hard disk, be sure you have first used FDISK to create the MS-DOS partition. If you later change the MS-DOS partition with FDISK, you will need to run FORMAT again for the new partition.

When you format a hard disk, the FORMAT program prompts you for the volume label:

```
Enter current Volume Label for drive d:
```

If your hard disk does not have a volume label, press the **Enter** key.

Note

If the hard disk has never been formatted or if it has a bad boot sector, FORMAT does not prompt you for the volume label.

If the volume label you enter does not match the label for the disk, the screen displays the following message:

```
Invalid Volume ID Format failure
```

After you enter the proper volume label, this message appears:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK DRIVE
d WILL BE LOST!
Proceed with Format (Y/N)?
```

If you want to format the hard disk, press **Y** and **Enter**. If not, press **N** and **Enter**.

Cautions

If you have reassigned disk drive descriptors with ASSIGN, cancel the assignments before you run FORMAT. Otherwise, you could destroy data.

Do not use FORMAT with any drives that are currently used in a JOIN or SUBST command.

This command may not work in a network environment.

The /4 switch allows you to use a 360KB, double-density diskette in a 1.2MB, high-density drive. If you write to this disk in a 1.2MB drive, however, you may have trouble reading or writing to it in a 360KB drive.

Examples

To format a diskette in drive B using all default values, type the following and press **Enter**:

```
FORMAT B:
```

You see the prompt:

```
Insert diskette for drive B:
and strike ENTER when ready
```

Insert the diskette you want to format in drive B and press **Enter** to start formatting. As MS-DOS formats the diskette it displays head and cylinder numbers:

```
Head: h Cylinder: c
```

When the diskette is formatted, you see this message:

```
Format complete
   xxxxxx bytes total disk space
   xxxxxx bytes available on disk
Format another (Y/N)?
```

Press **Y** and **Enter** to format another diskette or press **N** and **Enter** to leave the program.

To format a system disk on drive A and specify a volume label, type the following and press **Enter**:

```
FORMAT A:/S/V
```

The system displays the following prompt for the volume label:

```
Volume label (11 characters, ENTER for
none)?
```

To format the hard disk (after you have partitioned it with FDISK), type the following and press **Enter**:

```
FORMAT C:/S/V
```

The screen prompts you to enter the current volume label (if there is one) or enter a new one. Then the program formats the hard disk and copies the system files to it.

GRAFTABL *External*

Purpose

Loads a graphics table into memory to enable display of graphic characters in color/graphics mode.

Format

`[d:][path]GRAFTABL [nnn][/STATUS]`

Description

If your computer has a color/graphics adapter, you can use the GRAFTABL command to display ASCII characters with decimal values above 127 in graphics mode. GRAFTABL loads a special graphics character generator into memory so you can access these characters when you are using special application software or a programming language such as BASIC. You do not need to load this table if you are not in graphics mode.

If you also include one of the following code page numbers, you can access characters in that international language character set:

437	United States—English
850	Multilingual
860	Portugal
863	Canada—French
865	Nordic

The default is 437 (the United States). After you enter the GRAFTABL command, the screen displays a message such as the following:

```
USA version of Graphic Character Set Table
has just been loaded.
```

To display the number of the code page currently being used, include the /STATUS switch.

Once it is loaded, GRAFTABL remains in memory until you turn off or reset the computer. You can access any of the graphics or national language characters through the application software or programming language you are using.

Load the graphics table only once each session. If you give the command a second time, the following message appears:

```
USA version of Graphic Character Set Table is
already loaded
```

You may want to include GRAFTABL in your AUTOEXEC.BAT file so the table loads automatically every time you boot the system, or include it in a batch file for an application or programming diskette.

This command increases the size of MS-DOS in memory by 1KB.

Examples

To load the graphics character table, type the following and press Enter:

```
GRAFTABL
```

To load the French Canadian version of the graphics table, type the following and press Enter:

```
GRAFTABL 863
```

To display the number of the code page currently in effect, type the following and press Enter:

```
GRAFTABL /STATUS
```

GRAPH24 *External*

Purpose

Enables printing of screen graphics on a 24-pin or laser printer when you are using a color graphics adapter.

Format

`[d:][path]GRAPH24 [/R]`

Description

The GRAPH24 command is exactly like the GRAPHICS command except that it supports 24-pin printers and you cannot use the /B switch. If you have a 9-pin printer, use the GRAPHICS command. If you have a 24-pin printer, use GRAPH24.

You can use GRAPH24 with a laser printer that supports 24-pin mode, such as the Epson GQ-3500.

For detailed information on GRAPH24, see the GRAPHICS command, next in this chapter.

GRAPHICS *External*

Purpose

Enables printing of screen graphics when using a color/graphics adapter.

Format

`[d:][path]GRAPHICS [printer][/R][/B][/P=port][/LCD]`

Description

Use GRAPHICS to make exact printed copies of the image on your screen on a graphics-compatible printer. After GRAPHICS loads, the command prompt reappears on the screen. GRAPHICS is now in memory, and you can use it whenever necessary. GRAPHICS stays in memory until you reset or turn off the system.

Note

GRAPHICS supports 9-pin printers but not 24-pin printers. If you have a 24-pin printer, use the GRAPH24 command instead.

Specify any one of the following for *printer* (if you do not specify a printer, GRAPHICS defaults to the IBM® Graphics Printer):

Printer	*Installed Printer*
COLOR1	IBM Color Printer with a black ribbon
COLOR4	IBM Color Printer with a red, green, blue, and black ribbon
COLOR8	IBM Color Printer with a cyan, magenta, yellow, and black ribbon
COMPACT	IBM Compact Printer
COLOREPS	All Epson color printers
GRAPHEPS	Epson printers that support Esc * to specify bit-image mode. This is the mode suggested for use with Hercules® graphics

You can use the following switches with GRAPHICS:

Switch	*Function*
/R	Prints exactly what is on the monitor: black as black and white as white. If you do not specify /R, black prints as white and white as black. (Other colors are not affected by this switch.)
/B	Prints the background color (certain color printers only).
/P=*port*	Selects the parallel printer port to which you want to send the graphics when you press **Shift Print Screen**. The port may be set to 1, 2, or 3; the default is 1.
/LCD	Prints the screen image from the LCD screen of a portable computer.

You need to enter the GRAPHICS command only once after booting the system. To print the image you see on your screen, just press **Shift Print Screen** (or **PrtSc**). If you have an enhanced keyboard, you need to press only **Print Screen**.

If the computer is in 320x200 color graphics mode, and if the printer type is COLOR1 or GRAPHICS, GRAPHICS prints the screen contents with up to four shades of gray. If the computer is in 640x200 color graphics mode, GRAPHICS prints the screen contents sideways.

To enable GRAPHICS printing, your system's monitor must be in graphics mode. You can enter graphics mode through an application such as a window program or from BASIC. Text mode displays do not copy graphically, but print from the ordinary character set.

You can include the GRAPHICS command in a batch file, such as AUTOEXEC.BAT. GRAPHICS increases the size of MS-DOS in memory by approximately 2KB.

Example

To enable graphics, type the following and press **Enter**:

```
GRAPHICS
```

The screen displays this message:

```
Resident portion loaded
```

The following BASIC program uses the graphics screen. Once GRAPHICS is loaded, start BASIC and enter the program.

```
100 SCREEN 1
110 CLS
120 FOR K = 10 TO 50 STEP 5
130 CIRCLE (100,100), K
140 NEXT K
```

Run the program. To print what is displayed on the screen, simply press **Shift Print Screen**.

HDCACHE *External*

Purpose

Enhances the performance of a hard disk by storing the location and contents of requested sectors in a reserved part of memory.

Format

`[d:][path]HDCACHE [Cn][En]`

Description

HDCACHE makes your hard disk work more efficiently. Each time you request a new file, HDCACHE records the sector location of the file in a special part of the computer's memory (in the cache buffer) so the next time you request that file, MS-DOS finds it faster.

When you write (store) a file to disk, HDCACHE updates the information in the cache buffer to reflect the file's new location. This may cause the disk write process to take a little longer, but you typically read more files than you actually store.

If you enter the HDCACHE command with no parameters, the program creates a cache buffer in the standard memory area that is 64KB.

You can use these switches with HDCACHE:

Switch	*Function*
C*n*	Creates a cache buffer in the standard memory, where *n* is the size of the buffer in kilobytes
E*n*	Creates a cache buffer in the extended memory, where *n* is the size of the buffer in kilobytes

Note that you do not need to type the / when entering these switches.

Use the C switch if you want to change the size of the cache buffer in the standard memory area. The default size is 64KB. The buffer size can be up to the amount left in memory, less at least 64KB.

Use the E switch if you want the cache buffer to be in the extended memory area. The maximum size for this buffer depends on the size of the extended memory.

The cache buffer is allocated by tracks, so if you enter a size that is not a multiple of the track size, HDCACHE rounds the number up to the next track size. The size of a track is usually 7.5KB, which HDCACHE treats as 8KB.

You can use both switches if you want to create a buffer in both memory areas to get the most memory for the cache buffer.

In addition to the specified buffers, HDCACHE uses an additional 16 bytes per track in the standard memory area. The program leaves at least 64KB for other programs, but if there is less than 64KB available in memory, HDCACHE displays the following error message and then aborts:

```
Too small conventional memory
```

After you load HDCACHE the first time, the program displays the allocated size of each cache buffer. You can load the program only once each time you load MS-DOS. However, you can use the command again, without affecting the current buffers, to display the following information:

- The size of each cache buffer
- The total number of read requests whose sectors have been read from the cache buffer*
- The total number of read requests whose sectors have been read from the hard disk
- The total number of write requests.*

*After displaying this information on the screen, HDCACHE resets these values to zero.

The program also displays this message when you enter the command subsequent times:

```
HDCACHE already installed
```

Caution

Do not use HDCACHE with the IBM version of the VDISK program. If you do, you will destroy the contents of the extended memory.

Examples

To create a 128KB buffer in the standard memory area, type the following and press **Enter**:

```
HDCACHE C128
```

To create a buffer that is 32KB in the extended memory area, type the following and press **Enter**:

```
HDCACHE E32
```

To display information about the existing buffer(s), type the following and press **Enter**:

```
HDCACHE
```

HELP

External

Purpose

Provides helpful information on MS-DOS commands.

Format

`[d:][path]HELP [command...]`

Description

Use the HELP command to ask for information on any MS-DOS command or utility progam. This help function provides useful information but is not intended to be a substitute for this manual.

The two programs that provide HELP information, HELP.COM and HELP.TXT, must be in the same directory.

Type HELP to see a menu of all the commands. Type HELP followed by the name of one or more MS-DOS commands, each separated by a space, to bypass the menu and display the messages for each command.

At the bottom of the menu, you see this prompt:

```
↑↓→←Select command name,
Enter to display command, Esc to Exit
```

Use the cursor keys to select a command. (You can select only one command name at a time from the menu.) When the correct command is highlighted, press **Enter**. The help screen for the command appears.

If there is more than one page of text, you see the prompt PgUp on the top of the screen. Press **Page Up** to display the rest of the text. After reading the help information, press **Esc** to return to the menu.

If you type HELP and one or more command names on the command line, the help information for the first command appears. Press **Esc** to see the help information for the next command. When you press **Esc** after viewing the information for the last command, MS-DOS redisplays the command prompt.

JOIN *External*

Purpose
Joins a drive and all its files to a directory on another drive.

Format
`[d:][path]JOIN [d1: d2:\directory]`

`[d:][path]JOIN d:/D`

Description
This command joins a drive to a directory on a different drive to create a single directory structure. With JOIN you can refer to all directories on a specific drive with one path name.

When using application software that does not take advantage of the MS-DOS file handling features, you may have to change the current drive in order to access files from a different drive. For example, to use a separate hard disk or RAM disk for storing files, you must log on to these drives before they can be used. Using the JOIN command eliminates the need to change the current drive.

In the command format above, *d1* is the drive to be connected, or joined, to a directory on another drive.

d2:\directory is the directory on the second drive to be joined to the first drive. This directory must be empty and must be in the root directory. Also, this directory must not be the current directory and must have no subdirectories. All subdirectories of the source directory become sub-subdirectories in the new directory.

If *d2:\directory* does not already exist, it is created by JOIN on the specified drive.

Once you join the two drives, you cannot access the first drive directly. Use the /D switch to disconnect a join. For example, to restore the first drive, type the following and press **Enter**:

```
JOIN d: /D
```

You cannot disconnect a join if it is the current directory.

To list all drives that are currently joined, type JOIN only.

Cautions

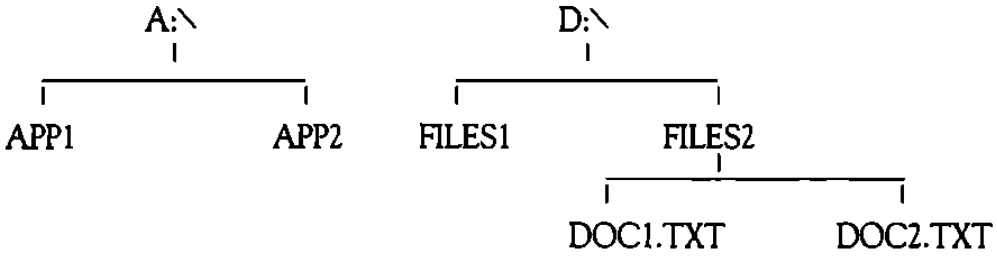
Do not use JOIN when the drive being joined is part of a SUBST or an ASSIGN command.

Do not use BACKUP, DISKCOMP, DISKCOPY, FORMAT, RESTORE, or SELECT while a JOIN is in effect.

This command may not work in a network environment.

Example

Assume these directory structures exist for drives A and D:



To use an application program located in APP1 of drive A while storing your files in FILES1 of drive D, you can use the JOIN command. First copy the JOIN command to your application diskette and insert it in drive A. Type the following and press **Enter**:

```
JOIN D: A:\DRIVED
```

Now, anytime you refer to the directory \DRIVED\FILES1 on drive A, all disk activity takes place in FILES1 on drive D without having to change the current drive.

If you type `DIR \DRIVED\FILES2`, you see:

```
DOC1 TXT
DOC2 TXT
```

To cancel the effect of the JOIN command on drive D, type:

```
JOIN D: /D
```

KEYB

External

Purpose

Loads a different keyboard layout into memory.

Format

`[d:][path]KEYB [xx[,[nnn],[[d:][path]KEYBOARD.SYS]]]`

Description

Use the KEYB command to replace the default keyboard layout in your computer's memory. This lets you type the characters that are in these other layouts instead of those on the default keyboard. By entering a two-letter code in place of the *xx* in the command, you can select one of the following language keyboards:

Country/language	*Keyboard code*	*KEYB command*
Australia	US	KEYB US
Belgium	BE	KEYB BE
Canada (English)	US	KEYB US
Canada (French)	CF	KEYB CF
Denmark	DK	KEYB DK
Finland	SU	KEYB SU
France	FR	KEYB FR
Germany	GR	KEYB GR
Italy	IT	KEYB IT
Latin America	LA	KEYB LA
Netherlands	NL	KEYB NL
Norway	NO	KEYB NO
Portugal	PO	KEYB PO
Spain	SP	KEYB SP
Sweden	SV	KEYB SV
Switzerland (French)	SF	KEYB SF
Switzerland (German)	SG	KEYB SG
United Kingdom	UK	KEYB UK
United States	US	KEYB US

Appendix C shows the layouts for these different keyboards. For some keyboards, you need to press *dead* keys to add an accent or umlaut to a character. (See Appendix C.)

To specify a particular code page (national language character set), include the appropriate code page number in place of the *nnn* in the command: 437, 850, 860, 863, or 865. See Chapter 9 and the CHCP command in this chapter for more information on code page switching. If you omit this number, KEYB uses the default code page.

You use the MODE command to prepare a code page required by the new keyboard layout. The keyboard layout and code page must be compatible. If the keyboard and display do not match, character keys may not be translated correctly into the correct code page, and characters may be displayed incorrectly. The following table shows the valid keyboard/code page combinations.

Code page	*Keyboard*
437	US, UK, FR, GR, IT, SP, LA, SV, SU, NL, BE, SF, SG
850	UK, FR, GR, IT, SP, DK, NL, SU, NO, PO, SV, SF, SG, CF, BE, LA, US
860	PO
863	CF
865	NO, DK

The KEYB command creates translation tables for each code page that has been prepared at the time you give the KEYB command and enables the code page you have requested. If you want to use a code page that is not in the list of prepared code pages, you need to prepare it first (with MODE) and then give the KEYB command. (See the description of MODE later in this chapter.)

Once you load a particular keyboard into memory, it remains there until you reset or turn off the computer or until you enter the command to return to the default keyboard. You can switch back and

forth between the default keyboard and the alternate layout with the following commands:

```
Ctrl Alt F1 - returns to the default keyboard
Ctrl Alt F2 - returns to the alternate
              keyboard
```

When a second keyboard is loaded in memory, it increases the size of MS-DOS by 6KB.

If you type KEYB without any options, a message such as the following appears:

```
Current keyboard code: FR Code page: 437
Current CON code page: 437
```

The file KEYBOARD.SYS contains tables that enable the KEYB command to convert scan codes to ASCII characters. The KEYB command must be able to access this file before it can change the keyboard layout. If KEYBOARD.SYS is not in the root directory, you need to include its drive and pathname in the KEYB command to specify the location of KEYBOARD.SYS.

Note
If you have created your own keyboard, specify its name in place of KEYBOARD.SYS.

If you use another keyboard layout often, you may want to include the KEYB command in your AUTOEXEC.BAT file.

If you use the SELECT command to format a disk, MS-DOS creates a system disk that automatically initiates the keyboard driver you specify.

The KEYB command sets the following exit codes which may help you perform error-detection batch processing:

0 Normal termination

1 Invalid code page, syntax, or language

2 Missing or invalid keyboard definition file

3 KEYB could not create a keyboard table in resident memory

4 Error occurred while communicating with the CON device

5 Specified code page has not been prepared

6 KEYB could not find the translation table for the selected code page in the resident keyboard table

Cautions

Because this command changes the keyboard layout, remember that some keys may be in a new position or not exist at all after loading this command. See Appendix C for the keyboard layouts.

In addition, be careful how you use application software written in U.S. format because your keys may send different signals (codes) to your operating system and application software.

Example

To use the German keyboard, type the following and press Enter:

```
KEYBGR
```

LABEL *External*

Purpose
Creates, displays, changes, or deletes a volume label on a disk.

Format
`[d:][path]LABEL [d:][volumelabel]`

Description
Use LABEL to identify your disks. The label can be up to 11 characters.

Do not use any of the following symbols as part of your disk label:

```
. " / \ [ ] : < > + = ; , ? * |
```

If you do not specify a disk drive descriptor, MS-DOS assumes you are labelling the disk in the default drive.

If you type LABEL only and do not specify a volume label, you see this prompt:

```
Volume label (11 characters, Enter for none)?
```

To give the disk a volume label or to change an existing volume label, type the new label and press **Enter**. The new label replaces the existing one.

To delete a volume label, press **Enter** only. You see the prompt:

```
Delete current volume label (Y/N)?
```

Press **Y** to delete the label, or **N** to exit without deleting the label.

Cautions
Do not use LABEL with drives that have been assigned a path name with SUBST or another drive name with ASSIGN.

This command may not work in a network environment.

Example

To change the volume label of the diskette in drive B to AP DATA, type the following and press **Enter**:

```
LABEL B:AP DATA
```

To display or erase the volume label WS DATA from a disk in drive B, type the following and press **Enter**:

```
LABEL B:
```

The screen displays the following:

```
Volume in drive B is WS DATA
Volume label (11 characters, Enter for none)?
```

Press **Enter**. You see the following prompt:

```
Delete current volume label (Y/N)?
```

Press **Y** and **Enter** if you want to delete the label or press **N** and **Enter** to leave the label.

MKDIR

Internal

Purpose

Creates (makes) a new subdirectory.

Format

`MKDIR [d:]path`

`MD [d:]path`

Description

Use MKDIR to create a subdirectory under the current directory or the specified directory. When you are in the root directory or one of its subdirectories, you can use MKDIR to create new subdirectories. If you do not specify a drive, the current drive is assumed. If your path starts with a backslash (\), MS-DOS starts its directory search with the root directory. If you omit the backslash, MS-DOS starts with the current directory.

Subdirectory names can be up to eight characters in length and can include all characters except a space or the following:

```
. " / \ [ ] : | < > + = ; , ? *
```

You can create any number of subdirectories provided disk space is available. The maximum length of a path name is 64 characters, including backslashes.

A directory can include file and subdirectory names that also appear in other directories. Therefore, files having the same name can be stored in separate directories.

You can abbreviate MKDIR to MD.

Caution

Be careful when you create directories while an ASSIGN, JOIN, or SUBST command is in effect.

Examples

To create a subdirectory called PROGRAMS in your root directory (on the current drive), type the following and press **Enter**:

```
MKDIR \PROGRAMS
```

To create a subdirectory named BASIC, under a directory named PROGRAMS on drive B, type the following and press **Enter**:

```
MKDIR B:\PROGRAMS\BASIC
```

If your current directory is PROGRAMS, you only need to type:

```
MD BASIC
```

By leaving out the \, you tell MS-DOS to begin at the current directory.

MODE

External

Purpose

Sets the way a printer, monitor, or serial port operates and prepares and controls code page switching.

Format

Parallel printer mode:

```
[d:][path]MODE  LPTn[:][chars][,[spacing][,[P]]]
```

Serial port mode:

```
[d:][path]MODE COMn[:]baud[,[parity]
               [,[databits][,[stopbits][,[P]]]]]
```

Redirecting parallel printer output:

```
[d:][path]MODE LPTn[:]=COMn[:]
```

Display modes:

```
[d:][path]MODE displaymode[,L][,R][,T]
```

Device code page modes:

```
[d:][path]MODE device CODEPAGE PREPARE=((nnn)
                      [d:][path]filename)
```

or

```
[d:][path]MODE device CODEPAGE PREPARE=
              ((nnn(,nnn...))[d:][path]filename)

[d:][path]MODE device CODEPAGE SELECT=nnn

[d:][path]MODE device CODEPAGE REFRESH

[d:][path]MODE device CODEPAGE [/STATUS]
```

You can use the following abbreviations in the code page commands:

CP instead of CODEPAGE
PREP instead of PREPARE
SEL instead of SELECT
REF instead of REFRESH
STA instead of STATUS

Description

Use this command to set or change the following aspects of your system's operation:

- Parallel printer selection, character width, and vertical spacing
- Serial port selection, baud rate, parity, data length, and stop bits
- Redirection of parallel printer output through serial ports for use by serial printers
- Monitor display format
- Preparation of one printer and monitor screen for code page switching.

Note

For a simpler method of using the MODE command, you can run the MENU program and select the Mode Settings option. See Chapter 5 for instructions.

To make these configuration changes to your printer, monitor, or serial port, enter the MODE command along with the appropriate parameters.

To select between printer, monitor, and serial port configurations, follow the MODE command with a device identifier. After the identifier, you give the parameters for the device itself.

Device	*Command/identifiers*
Printer	MODE LPT*n*: *(parameters)*
Monitor	MODE *displaymode (parameters)*
Serial port	MODE COM*n*: *(parameters)*
Printer redirect	MODE LPT*n*: *(parameter)*

If you use the parameters provided by MODE often, you may want to include the appropriate commands in your AUTOEXEC.BAT file or in batch files for other programs that require mode setting changes.

Changing parallel printer settings with MODE

MODE offers these options for operating your parallel printer:

- Select between three logical printer devices: LPT1, LPT2, and LPT3
- Select the number of characters to print on each line, either 80 (standard) or 132 (condensed)
- Select the number of lines to print per vertical inch, either six or eight
- Select a retry when a printer error occurs.

To change printer settings, use the following format:

```
MODE LPTn: [chars][,[spacing][,[P]]]
```

The *n* represents either 1, 2, or 3. Unless you add a special option card to your computer system, the line printer device selection is limited to LPT1; the other two options are not available.

Type the MODE command first. Then enter a space, the device identifier, and a colon. After the colon, enter the number of characters per line (80 or 132), a comma, then the number of lines you want to print per inch (6 or 8). If you want your printer to retry printing when it encounters an error, type another comma and P at the end of the command (optional). Always state the first two parameters when using [P] even if you want them to remain at their default values.

At the end of the command line, press **Enter**. As MS-DOS activates each parameter, a message appears. Once MODE is complete, the command prompt returns.

If you type a parameter incorrectly (for example, using 95 instead of 80 for the number of characters per line), MODE sets the default value. If you choose the P option for printer retries, you might create an endless loop of retrying. Press **Ctrl C** to cancel continuous retries.

Changing serial port operation with MODE

MODE offers these options in the operation of your serial port:

- Four logical port numbers: COM1, COM2, COM3, or COM4
- Eight baud rates, from 110 to 9600
- Odd, even, or no parity
- A data length of seven or eight bits
- One or two stop bits
- The option to retry on errors.

The serial port device selection is limited to COM1: unless you install other serial port option cards.

To change serial port settings, use this format:

```
MODE COMn: baud[,[parity][,[databits]
                [,[stopbits][,[P]]]]]
```

Type the MODE command name, a space, the device identifier, and a colon. You must specify the COM port and baud rate. Include each of the parameters after baud rate only if you want to change them from the default values. Separate each parameter from the next with a comma.

Table 4-1 shows the options for each parameter, the default value MS-DOS assumes, and how to enter each one on the command line.

Table 4-1. MODE options

Parameter	Options	Entry	Default
Port	1, 2, 3, or 4	COM1:, COM2:, COM3:, COM4:	none
Baud	110 150 300 600 1200 2400 4800 9600 19200	110, 150, etc.	none
Parity	odd, even, none	O, E, N	E
Databits	7 or 8	7, 8	7
Stopbits	1 or 2	1, 2	1 (2 if baud rate is 110)
Error retry	Yes or No	P or blank	blank

When you select the retry option, MODE becomes resident in memory. Press **Ctrl C** to stop a continuing loop of retries.

Once you type the necessary parameters on your command line, press **Enter**. MODE loads and then makes any setting changes to your serial port. After each change occurs, a message appears on your screen.

You can leave a parameter out because you want the default value as part of the setting, but you must enter a comma in its place. For example, to change only the *databits* parameter and accept the default settings for *parity* and *stopbits*, use the following format:

```
MODE COMn: baud,,databits,,
```

Changing printer output direction

MODE permits you to redirect parallel printer output from one of three logical printer devices to one of four logical serial port devices. In other words, instead of sending printer data out through the parallel printer port, you can direct it to your serial port for use by a serial printer or another serial device.

MS-DOS accepts the following device identifications (logical devices) for parallel and serial output:

Parallel printer	*Serial communications*
LPT1:	COM1:
LPT2:	COM2:
LPT3:	COM3:
	COM4:

Unless you install special option cards to enable additional output, devices LPT2:, LPT3:, COM2:, COM3:, and COM4: are not available. Although they exist logically in the operating system, the physical connections (to other printers or a second serial port) do not exist unless you add the option cards.

To redirect printer output, use this format:

```
MODE device1 = device2
```

Substitute device numbers to use other printer or serial port combinations.

There are many opportunities to use MODE in batch files, or separately. For example, you may use a particular application that requires a different setting. You need to enter the new setting and change it back again each time you use this application. If you place the application in a batch file, with a MODE command before and after it, the setting changes occur automatically.

Changing monitor display format with MODE

MODE offers these options for your monitor display:

- Choose 40- or 80-column width, in black and white, monochrome, or color display
- Align the screen image to the left [L] or right [R]
- Show a test pattern [T] to verify and adjust the screen image.

To change your monitor display, use the following format:

```
MODE displaymode[,L][,R][,T]
```

L and R are mutually exclusive.

Type the MODE command name first and enter a space. You must enter the *displaymode* parameter, but the right/left *alignment* and *test* pattern parameters are optional.

The *displaymode* parameter offers various screen width and color options. You select one of the following:

Displaymode	*Description*
40	40-column screen width
80	80-column screen width
BW40	Black and white 40-column screen
BW80	Black and white 80-column screen (default)
CO40	Color 40-column screen
CO80	Color 80-column screen (used with color monitor)
MONO	Monochrome display adapter (which always has a display width of 80 characters per line)

The standard mode is BW80. If you have a color monitor, then CO80 is standard.

You can use the *alignment* parameters (L and R) to shift the screen image one column to the left or right. To move more than one column, you need to repeat the command for each column you want to move. If you add the test parameter (T) after the L or R, a test line appears on the screen asking if you see the leftmost or rightmost character in the line. If you enter **N**, the line moves one column in the appropriate direction and the question appears again. When the image is aligned as you want it, type **Y**. Use the test parameter with a color monitor only. L, R, and T are valid only with a EGA adapter.

At the end of the command line, press **Enter**. MODE loads, your display format changes, and the command prompt returns. Your screen doesn't show an example screen pattern unless you include the test parameter.

Setting the code page

You must use the MODE command to prepare and select a code page before you can use that keyboard layout with the device you select. Use the mode command to:

- Prepare one or more code pages to be selected for use by your printer or monitor.
- Select which code page to use with which device. This activates the code page so you can use it on the designated device.
- Refresh (reselect) a code page that was deactivated because of an error. For example, turning off the printer may cause a code page to disappear.
- Display the current status of code page selections for a particular device.

Be sure to read Chapter 9 for complete information on code page switching.

Note

If you do not have an EGA adapter, you will not be able to display certain code pages on your monitor. If you do not have a printer that supports the code page you select, you will not be able to print all characters in that character set.

PREPARE—Before you can prepare a code page, you must have used the DEVICE command in the CONFIG.SYS file to activate the device driver(s) for which you want to use code page switching.

To prepare one or more code pages, use one of the following command formats:

```
MODE device CP PREP=((nnn)[d:][path]filename)
```

or

```
MODE device CP PREP=((nnn[,nnn...])
[d:][path]filename)
```

Type the MODE command, a space, the name of the device, a space, then CP PREP (or CODEPAGE PREPARE) followed by an equal sign. Use the first command format if you are preparing only one code page; use the second format if you are preparing more than one.

The *d:*, *path*, and *filename* identify the Code Page Information file that MS-DOS should use to prepare a code page for the device specified. These files have the extension .CPI.

You can enter one of the following devices in the command:

```
CON, LPT1, LPT2, LPT3
```

You can include only one device in a MODE command. If you want to use a code page or pages on another device, enter the MODE command again specifying the device.

You can enter one or more of the following code page numbers in the command:

437	United States—English
850	Multilingual
860	Portuguese
863	Canada—French
865	Nordic

To include more than one code page, list the numbers within parentheses and separate them with commas. For example, to prepare 437, 850, and 863, you would enter the code page part of the command as follows:

```
((437,850,863)[d:][path]filename)
```

If you later decide to change one of the code pages to a different one, but want to keep the others, use a comma to represent the ones you do not want to change. For example, to change 437 to 860, you would type the following:

```
((860,,)[d:][path]filename)
```

You must enter at least one code page number in the command.

Choose one of the following filenames for the code page information file:

```
EGA.CPI, 4301.CPI
```

Be sure to include the proper pathname so MS-DOS can find the file.

SELECT—To select the code page to be used with a particular device, use the following command format:

```
MODE device CP SEL=nnn
```

Type MODE, a space, the name of the device (CON, LPT1, LPT2, or LPT3), a space, CP SEL (or CODEPAGE SELECT), an equal sign, and the number of the desired code page (437, 850, 860, 863, or 865). You can enter only one code page at time with the SELECT parameter.

Before you can select a code page, you must have done the following:

- Used the DEVICE command in the CONFIG.SYS file to activate the device driver(s) for which you want to use code page switching
- Used the PREPARE parameter with the MODE command to prepare the code page.

REFRESH—To refresh (reselect) a code page that has been deactivated, use this command format:

```
MODE device CP REF
```

Type MODE, a space, the name of the device (CON, LPT1, LPT2, or LPT3), a space, and CP REF (or CODEPAGE REFRESH). This command reactivates a code page you had prepared and selected previously but that was deactivated for one reason or another (such as if the printer was turned off).

/STATUS—Use the /STATUS switch if you want to display the code pages currently prepared and selected for a device:

```
MODE device CP /STATUS
```

Actually, /STATUS is optional; the following command does the same thing:

```
MODE device CP
```

Either command displays information similar to the following:

```
Active codepage for device LPT1 is 850
hardware codepages:
   Codepage 437
prepared codepages:
   Codepage 437
   Codepage 850
   Codepage 860
MODE Status Codepage function completed
```

Examples

To set your printer to print 132 characters per line, 8 lines per inch, type the following and press **Enter**:

```
MODE LPT1: 132,8
```

MODE loads, changes your printer, and the screen displays the following:

```
LPT1: set for 132 chars/line
8 lines/inch vertical spacing set
```

The command prompt reappears.

To see the effect of the MODE command on your color monitor, set the screen to display 40 columns wide instead of 80. Type the following and press **Enter**:

```
MODE 40
```

MODE loads, changes the format of your display, then returns the command prompt to the screen. You can see that the characters are now twice as wide. Use the command MODE 80 to restore normal width display.

To change the *databits* parameter for your serial port, type the following and press **Enter**:

```
MODE COM1: 9600,,7,,
```

MODE reports the new configuration:

```
COM1: 9600,e,7,1,-
```

To redirect printer output, type the following and press **Enter**:

```
MODE LPT1:=COM1:
```

MODE reports the redirection:

```
LPT1:redirected to COM1
```

To prepare the Canada—French and Nordic code pages for the monitor (CON) using the code page information file EGA.CPI, type the following and press **Enter**:

```
MODE CON CP PREP=((863,865)EGA.CPI)
```

To select the United States code page for parallel printer LPT2, type the following and press **Enter**:

```
MODE LPT2 CP SEL=437
```

To refresh a code page for your printer, type the following and press **Enter**:

```
MODE LPT1 CP REFRESH
```

To display the current status of code pages for the monitor, type the following and press **Enter**:

```
MODE CON CODEPAGE /STATUS
```

MORE

External (filter)

Purpose

Displays long data listings one screen at a time.

Format

```
[d:][path]command ¦ [d:][path]MORE

MORE <filename
```

Description

When you specify the MORE command, MS-DOS reads the input and displays one screen of information at a time. The screen displays the following message on the last line:

```
-- MORE --
```

Press any key to display the next screen of information. Repeat this process until you have seen all the input data. MORE is useful for looking at a list of files in a large directory or viewing a long file.

Examples

To display the file MYFILES.TXT (on the default drive) one screen at a time, type the following and press **Enter**:

```
TYPE MYFILES.TXT ¦ MORE
```

To display the directory of files (on the default drive) one screen at a time, type the following and press **Enter**:

```
DIR ¦ MORE
```

To display the file LONGLIST on drive A one screen at a time, type the following and press **Enter**:

```
MORE <A:LONGLIST
```

NLSFUNC

External

Purpose

Provides support for code page switching.

Format

`[d:][path]NLSFUNC [[d:][path]filename]`

Description

The NLSFUNC command enables support for extended country information and lets you use the CHCP command to select a code page (national language character set) for any device that supports code page switching. NLSFUNC also lets you select a country information file other than the one specified in your CONFIG.SYS file. Be sure to read Chapter 9 for complete information about code page switching.

If you do not specify a filename after NLSFUNC, the command uses the file defined by the COUNTRY command in your CONFIG.SYS file. If you want to use a different country information file, include the drive, path, and name of the file in the command.

You use the CHCP command (described in this chapter) to select a code page for all devices defined with code page switching support. But you must first load the NLSFUNC command into memory before giving the CHCP command. You may want to include the NLSFUNC command in your AUTOEXEC.BAT file.

Examples

To enable code page switching using the country information file in your CONFIG.SYS file, type the following and press **Enter**:

```
NLSFUNC
```

To enable code page switching using the country information file named COUNTRY2.SYS in the DOS directory on drive C, type the following and press **Enter**:

```
NLSFUNC C:\DOS\COUNTRY2.SYS
```

PATH

Internal

Purpose

Sets a search path for programs and batch files that are not in the current directory. Once you have used this command, you can run programs in other directories without specifying their pathnames.

Format

```
PATH [[d:]path1[;[d:]path2...]]

PATH;
```

Description

Use PATH to identify the directories that MS-DOS must search to locate external commands when they are not in the current directory. MS-DOS searches the directories in the path (in the specified order and on any drive) until it finds the command to be executed. PATH stays in effect until you reset the system or set another path.

This command is most useful when it is part of an AUTOEXEC.BAT file, which means that it is executed each time you boot MS-DOS. See Chapter 7 for further information.

Use the format PATH *path1;path2;path3* to specify several paths by separating each path with a semicolon. MS-DOS searches the paths in the order you specify.

Type PATH; (with a semicolon only) to set a null path, instructing MS-DOS to search only the current directory for external commands.

Type only PATH (with no path names) to display the current path.

MS-DOS searches the specified path only for command files (those having .COM, .EXE, and .BAT extensions) and then only when attempting to execute them. The current directory is not changed by this command.

Examples

To tell MS-DOS to search your \DOS\MENU directory (on drive C) for external commands, type the following and press **Enter**:

```
PATH C:\DOS\MENU
```

To search this path and two others, type the following and press **Enter**:

```
PATH C:\DOS\MENU;\SPRDSHT;\BASIC\NUMBERS
```

To display the current path, type the following and press **Enter**:

```
PATH
```

If the above paths have been entered, the screen displays the following:

```
PATH=C:\DOS\MENU;\SPRDSHT;\BASIC\NUMBERS
```

To have MS-DOS search only the current directory and *not* the previously specified path or paths, type the following and press **Enter**:

```
PATH;
```

PRINT *External*

Purpose

Prints a text file (or set of files) on a printer.

Format

```
[d:][path]PRINT [/D:device][/B:buffersize]
                [/U:busytick][/M:maxtick]
                [/S:timeslice][/Q:queuesize]
                [/T][/C][/P]
                [[d:][path][filename]...]
```

See the example section for further information on the placement of the switches.

Description

Use PRINT to output files to a printer while you continue other processing with your computer. The files to be printed are stored in a print queue.

You can use these switches with the PRINT command:

Switch	*Function*
/D:device	Specifies the print device; the default is PRN.
/B:*buffersize*	Sets the size in bytes of the print buffer (the default is 512). Increasing the value of *buffer* may enhance the speed of the PRINT command. The maximum size of the print buffer depends on the amount of memory available.
/U:*busytick*	Specifies the number of computer clock ticks (busy ticks) that PRINT will wait until the printer is available; the default is 1. If PRINT waits longer than this value, it gives up its timeslice (/S).
/M:*maxtick*	Specifies the number of clock ticks that PRINT can use to print a character. The value can be from 1 to 255 clock ticks; the default is 2.

Switch	*Function*
/S:timeslice	Specifies the number of clock ticks for a timeslice. The value can be from 1 to 255 timeslices; the default is 8.
/Q:queuesize	Specifies the number of files allowed in the print queue. The value can be from 4 to 32 files; the default is 10. To change the value, you must give the PRINT command without any filenames, for example, `PRINT /Q:32`.
/T	Selects terminate mode; deletes all files in the print queue waiting to be printed. A message alerts you to the deletion.
/C	Selects cancel mode; suspends printing of files in the print queue. The specified file and all following files on the command line are removed from the print queue until you type a /P switch.
/P	Selects print mode; enters files in the print queue. The specified file and all following files on the command line are entered in the print queue until you type a /C switch.

You can enter the /D, /B, /U, /M, /S, and /Q switches only the first time you give the PRINT command after starting MS-DOS. Once you set these switches, they remain in effect until you turn off or reset the computer.

If you do not specify the device name (/D), the first time you use the PRINT command, you see this prompt:

```
Name of list device [PRN]:
```

You can specify any output list device, such as LPT1, LPT2, LPT3, PRN, COM1, COM2, COM3, COM4, or AUX. Then press **Enter**. Press just **Enter** to select the default PRN device. The device you select must be attached to your system.

The files are queued for printing in the order you enter them. Any files in the print queue must remain unaltered on the disk in the specified drive until printing is complete.

You can use wildcard characters in the filenames. Also, you can specify more than one filename, each with the appropriate switches. Each print queue entry can contain a maximum of 64 characters, including the drive descriptor.

Type PRINT without a file specification to display the contents of the print queue on your screen without affecting the queue's contents.

After a file is entered in the print queue, you can change the current directory without affecting the print status of files in the queue.

Caution

If you have reassigned disk drive descriptors with ASSIGN, cancel the assignments before you run PRINT.

Examples

To set the size of the print buffer to 800 bytes, type the following and press **Enter**:

```
PRINT /B:8ØØ
```

To empty the print queue, type the following and press **Enter**:

```
PRINT /T
```

Note

Each switch affects the file *before* it and all the files after it until the file *before* the next switch. In the last example, the /C switch affects TEMP1.TST and the /P switch affects both TEMP2.TST and TEMP3.TST.

To remove these three files from the print queue, type the following and press **Enter**:

```
PRINT A:TEMP1.TST /C A:TEMP2.TST A:TEMP3.TST
```

To remove TEMP1.TST from the queue, and then add TEMP2.TST and TEMP3.TST to the queue, type the following and press **Enter**:

```
PRINT TEMP1.TST /C TEMP2.TST /P TEMP3.TST
```

PROMPT *Internal*

Purpose

Changes or resets the MS-DOS command prompt.

Format

PROMPT [*string*]

Description

Use PROMPT to change the MS-DOS system prompt from A) to any string of characters. Whatever you specify for the string parameter becomes the command prompt until you specify a different prompt, or reset or turn off the computer.

Type PROMPT only (without a string of characters) to reset the prompt to the default drive identifier.

You can use the following characters in your PROMPT command to specify special prompt information. You must precede these characters with a dollar sign ($) in the string.

Specify this character:	*To get this in your prompt:*
_ (underscore)	Enters a carriage return/line feed sequence (goes to beginning of a new line)
b	Enters a | character, to show piping commands
d	Enters the current date
e	Enters an ASCII code of hex 1B (used in ANSI character sets)
g	Enters the) character
h	Enters a backspace; the preceding character is erased
l	Enters the (character
n	Enters the default drive

Specify this character:	*To get this in your prompt:*
p	Enters the current directory of the default drive
q	Enters the = character
s	Enters a leading space only
t	Enters the current time
v	Enters the MS-DOS version number

Any other characters are ignored by PROMPT.

If your system has an ANSI.SYS driver set in CONFIG.SYS, you can use escape sequences in your prompts.

Examples

To set the default drive letter prompt without any symbol, type the following and press **Enter**:

```
PROMPT $n
```

The screen displays A (if A is the default drive).

To set the prompt to the current drive and directory followed by the > symbol, type the following and press **Enter**:

```
PROMPT $p$g
```

If your current directory is WORD\WORK on the B drive, the screen displays the following:

```
B:\WORD\WORK>
```

To set the prompt to include a message such as READY as well as the > symbol, type the following and press **Enter**:

```
PROMPT READY$g
```

The screen displays:

```
READY>
```

To set a two-line prompt with the time and date, type the following and press **Enter**:

```
PROMPT Time = $t$_Date = $d
```

The screen displays the following prompt with the current time and date:

```
Time = 13:05:23.88
Date = Thu  3-24-88
```

If you have an ANSI escape sequence driver, you can set the prompts in reverse video mode and return to normal video mode for other text. Type the following and press **Enter**:

```
PROMPT $e[7m$n:$e[m
```

To reset the prompt to the default drive descriptor, type the following and press **Enter**:

```
PROMPT
```

The screen displays the default command prompt, for example:

```
B>
```

RECOVER *External*

Purpose

Recovers a file or an entire disk containing bad sectors.

Format

```
[d:][path]RECOVER [d:][path]filename
[d:][path]RECOVER d:
```

Description

Use RECOVER to check individual files for damage and to reconstruct the directory of a damaged disk. If a sector is bad, you can recover either the file containing that sector or the entire disk. When you recover a file, any bad sectors are deleted from the file. Recover the entire disk if the bad sector is in the directory.

Type RECOVER *filename* to recover a particular file. MS-DOS reads the file sector by sector and skips the bad sector(s). When MS-DOS finds the bad sector, it marks it and no longer writes data to that sector.

Type RECOVER *d:* to recover a disk (*d* represents the descriptor of the drive containing the disk). When you recover an entire disk, all filenames change to FILE*nnnn*.REC (*nnnn* represents a sequential number starting with 0001). The date and time change to your current settings.

Cautions

If you have reassigned disk drive descriptors with ASSIGN, cancel the assignments before you run RECOVER. Otherwise, the program does not work properly.

This command may not work in a network environment.

Examples

To recover the file APFILE on drive A, type the following and press Enter:

```
RECOVER A:APFILE
```

The file APFILE is read sector-by-sector and bad sectors are skipped.

To recover the contents of the entire disk in drive B, type the following and press **Enter**:

```
RECOVER B:
```

RENAME

Internal

Purpose

Renames the specified file or files.

Format

RENAME [*d:*][*path*]*filename1 filename2*

REN [*d:*][*path*]*filename1 filename2*

Description

Use RENAME to change the name of one or more files. You change the name of the old file to that of the new file. You can type the command name either as RENAME or REN.

You cannot specify a drive or path with the new filename. The file remains on the drive and in the directory where it currently resides.

You can use the wildcard characters * and ? to rename a group of files. When you use the ? wildcard character in the filename, the corresponding character positions do not change.

You cannot rename a file using the name of an existing file in the directory.

Examples

To change MYFILE.TXT to YOURFILE.DOC on the current drive, type the following and press Enter:

```
REN MYFILE.TXT YOURFILE.DOC
```

To change the extensions of all files with an .LST extension to a .PRN extension, keeping the same filenames, type the following and press Enter:

```
REN *.LST *.PRN
```

To rename the file ABODE on drive B to ADOBE, type the following and press Enter:

```
REN B:ABODE ?D?B?
```

REPLACE *External*

Purpose

Selectively replaces or adds files including subdirectories.

Format

```
[d:][path]REPLACE [d1:][path][filename]
                  [d2:][path][/A][/P][/R][/S][/W]
```

Description

Use REPLACE to replace files on the target disk with files of the same name from the source disk. You can also add files, copying them from the source to the target.

Note

An easier way to use the REPLACE command is through the MENU utility. See Chapter 5 for instructions.

In the format above, *d1* is the source and *d2* is the target. You must specify at least a drive, path, or filename for the source.

For the target, you can specify a drive or path, but you do not specify a filename. If you omit the target, the specified source files replace files in the current directory of the default drive.

Whether replacing or adding files, you can copy files to subdirectories on the target by using the /S switch. You can use wildcards to replace groups of similarly-named files.

You cannot use REPLACE to update hidden files or system files.

You can use the following switches with REPLACE:

Switch	*Function*
/A	Copies all files that do not exist on the target. /A only *adds* files, but does not overwrite existing files. You cannot use /A together with /S.

Switch	*Function*
/P	Prompts you to reply Yes or No before replacing each file on the target.
/R	Replaces files on the target that are read-only. Without /R, read-only files cannot be overwritten.
/S	Replaces files in all subdirectories on the target. You cannot use /S and /A together.
/W	Waits for you to insert a diskette before beginning to search for source files.

REPLACE sets the following exit codes, which may help you perform error-detection batch processing:

0 Normal termination of command

1 Command line error

2 File not found

3 Path not found

5 Access denied

8 Insufficient memory

15 Invalid drive

Examples

To replace existing files in all subdirectories on drive C with files from drive A, type the following and press **Enter**:

```
REPLACE A:*.* C:/S
```

To *add* files from drive A to the \WORK subdirectory on drive C, type the following and press **Enter**:

```
REPLACE A: C:\WORK /A
```

To replace the file LONG.LST on drive B with the file on the source diskette in drive A and have the system wait for you to insert a diskette, type the following and press **Enter**:

```
REPLACE A:LONG.LST B: /W
```

The screen displays the following:

```
Press any key to begin replacing file(s)
```

RESTORE *External*

Purpose

Restores files copied with the BACKUP command.

Format

```
[d:][path]RESTORE d1: [d2:][path][filename][/M]
                  [/N][/P][/S][/A:date][/B:date]
                  [/E:time][L:time]
```

Description

Use RESTORE to restore files that have been copied with the BACKUP command. (BACKUP creates specially-formatted files that are not usable until you restore them with the RESTORE command.)

Note

An easier way to use the RESTORE command is through the MENU utility. See Chapter 5 for instructions.

In the command format above, *d1* is the source drive, the one that contains the BACKUP files, and *d2* is the target drive to which you want to restore the files.

For the source, specify only the drive that contains the backup files. For the target, you can specify a drive, path, and/or filename. If you omit the target, the backup files are restored to the current directory of the default drive. If you specify a path for the target, you must restore the files to the same directory they were in when BACKUP copied them.

You can use wildcards to restore groups of similarly-named files.

You can use the following switches with RESTORE:

Switch	*Function*
/M	Restores only those files that have been modified since the last BACKUP. If you use /M with /N, /M is ignored.
/N	Restores only those files that no longer exist on the target disk.

Switch	*Function*
/P	Prompts you to reply Yes or No before restoring files that have been changed since the last backup, or that are marked read-only (see ATTRIB).
/S	Restores files in all subdirectories beyond the specified directory in addition to the files in the specified or current directory. (If the specified or current directory is the root directory, /S restores files in all subdirectories.)
/A:*date*	Restores only those files that were modified on or *after* the specified date.
/B:*date*	Restores only those files that were modified on or *before* the specified date.
/E:*time*	Restores only those files that were modified on or *earlier* than the specified time.
/L:*time*	Restores only those files that were modified on or *later* than the specified time.

Note
The date and time formats depend on the COUNTRY code selected.

RESTORE prompts you to insert the source diskettes in the order they were backed up with BACKUP. If you insert the wrong diskette, RESTORE prompts you to insert the next diskette until you insert the correct one.

If you use wildcards in the filename or extension, RESTORE restores all the files that match the wildcard files; then it prompts you to insert the next diskette.

If you are sharing files, you can restore only those files that you normally can access. If you try to restore a file that you are not permitted to access, the screen displays the following message:

```
PATHNAME\FILENAME.EXT
Not able to restore at this time
```

RESTORE sets the following exit codes which may help you perform error-detection batch processing:

0 Normal termination of command

1 No files were found to restore

3 Terminated by user

4 Terminated because of an error

Caution

Do not use RESTORE while the ASSIGN, JOIN, or SUBST commands are in effect.

Examples

To restore all files including files in subdirectories from backup diskettes on drive A to the hard disk (drive C), type the following and press **Enter**:

```
RESTORE A: C:*.* /S
```

To restore FILEIT.DOC from a backup diskette in drive A to drive B, type the following and press **Enter**:

```
RESTORE A: B:FILEIT.DOC
```

To restore files that have a .DOC extension from backup diskettes in drive A to drive C, type the following and press **Enter**:

```
RESTORE A: C:*.DOC
```

To restore all files from backup diskettes in drive A to drive C, and have the system prompt you if any files on drive C have changed since the last BACKUP or if any files are marked read-only, type the following and press **Enter**:

```
RESTORE A: C:/P
```

RMDIR

Internal

Purpose

Removes (deletes) an empty subdirectory.

Format

`RMDIR [d:]path`

`RD [d:]path`

Description

Use RMDIR to remove an empty directory from a directory tree. The directory must be empty except for the . and .. shorthand symbols. Therefore, you must delete all files before you delete the directory. (You can do this by typing DEL `*.*` when you are in the directory you want to delete.)

When you specify a path, RMDIR removes the last directory name in the path. If you do not specify a drive, the current drive is assumed.

You cannot remove the current directory or the root (\) directory. Also, you cannot remove subdirectories that contain hidden files.

Cautions

Be careful when removing a directory while a JOIN or an ASSIGN is in effect. You cannot remove a directory if it has been substituted (SUBST).

Before removing a directory, it is a good idea to first issue a DIR command for that directory to ensure that the directory does not contain any files that you do not want to delete.

Example

To remove the \OUT subdirectory located under the ELECMAIL directory, which is in the root directory (on the current drive), type the following and press **Enter**:

```
RMDIR \ELECMAIL\OUT
```

SELECT *External*

Purpose

Formats and installs MS-DOS on a new disk with the country information and keyboard layout you select.

Format

```
[d:][path]SELECT [d1: d2:[path]] nnn xx
```

Description

Use SELECT to create a system disk that configures your system for a specific MS-DOS country and international keyboard layout. All system disks distributed by Epson automatically configure the system for the country of sale. This means you need to use SELECT only when you frequently use the layout of a different country.

You can also use SELECT to format your hard disk and prepare it for auto-booting MS-DOS. At the same time, SELECT can also copy all MS-DOS command files to a specified directory on the hard disk.

SELECT uses FORMAT to initialize the target disk and XCOPY to copy all the files from the source system disk to the target disk. SELECT also creates new CONFIG.SYS and AUTOEXEC.BAT files on the target disk that contain the appropriate commands to correctly boot the system.

The *d1* is the MS-DOS source drive and it must be either drive A or B. You cannot use a hard disk as the source with SELECT. If you specify *d1*, you must also specify *d2*, the target. If you do not specify any drive, SELECT assumes drive A for the source disk and drive B for the target disk. On a single drive system, you are prompted to exchange the disks at the appropriate time.

The path is the name of the directory on the target disk in which you want to store all MS-DOS command files. SELECT automatically creates this directory after it formats the target disk.

As part of the SELECT command, you must include a country and keyboard code (shown above as *nnn xx*). The country code allows you to choose how the computer handles country-dependent information. You can choose the formats for the following types of displays (the formats in parentheses are the standard United States formats):

- Date format (*mm-dd-yy*)
- Time format (*hh:mm:ss*)
- Currency symbol ($)
- Decimal separator (.).

The keyboard code allows you to choose from a variety of international keyboard layouts, illustrated in Appendix C.

Use 001 US for *nnn xx* if you want to use the standard United States format and keyboard layout. Table 4-2 lists the acceptable values of *nnn* and *xx*.

Table 4-2. Country dependent information

Country	USA	France	Germany	United Kingdom	Italy	Spain
Country code (*nnn*)	001	033	049	044	039	034
Keyboard code (*xx*)	US	FR	GR	UK	IT	SP
Date/time format	1	2	2	2	2	2
Currency symbol	$	F	DM	lb.	Lit	Pts
Thousands separator	.	space	.	.	.	.
Decimal separator	.	,	,	.	,	,
Date separator	—	/	.	—	/	/
Time separator	:	.	.	.	:	:
Currency format	00	03	00	00	01	03
Currency decimal places	2	2	2	2	0	2
Time format (hours)	12	24	24	24	24	24
Data list separator	,	;	;	,	;	;

A CONFIG.SYS file is created on the target disk with the COUNTRY=*xxx ccc, d:\path*\COUNTRY.SYS command. (The *ccc* is the code page number.) An AUTOEXEC.BAT file is created on the target disk with the following commands:

```
PATH \;[\path;]
KEYB xx ccc [d:\path]KEYBOARD.SYS
ECHO OFF
CLS
DATE
TIME
VER
```

For hard disks, the PATH command includes the target drive letter. If the keyboard code is US, KEYB*xx* is not placed in the file.

The instructions below describe how to use SELECT on a diskette and then on a hard disk.

Warning
The SELECT procedure destroys all data on your destination diskette or the hard disk's MS-DOS partition. Use SELECT only on a blank diskette or on a hard disk that does not have files stored on it.

Using SELECT on a diskette

This procedure describes how to use SELECT with two diskette drives. If you have only one diskette drive, the procedure is the same except you must swap diskettes at the appropriate times. (Follow the system prompts.)

1. Insert the MS-DOS diskette that contains the SELECT program in drive A and a blank diskette in drive B.
2. At the A> prompt, type the following and press **Enter**:

```
SELECT A: B: ØØ1 US
```

The screen displays this message:

```
SELECT is used to install DOS the first
time. SELECT erases everything on the
specified target and then installs DOS.
Do you want to continue (Y/N)?
```

3. If your diskette has no files stored on it, press **Y**. Or press **N** to cancel the procedure. If you press **N**, the A> prompt reappears. If you press **Y**, the system prompts you to do the following:

```
Insert new diskette for drive B:
and strike ENTER when ready
```

4. Just press **Enter** to format the diskette. (You already have inserted a new diskette in drive B.) MS-DOS begins formatting the diskette. The screen continuously displays the changing head and cylinder numbers. Besides formatting the diskette, MS-DOS also copies the operating system files to the disk. When the procedure is complete, the screen displays the following:

```
Format complete
System transferred
```

The screen now displays disk space information and then displays the following message:

```
Format another (Y/N)?
```

5. Press **N** and press **Enter**. You see this message:

```
Reading source file(s)...
```

At this point, MS-DOS copies all the files from the MS-DOS diskette to the newly-formatted diskette. The file names appear on the screen as they are copied to the hard disk. When all the files are copied, the A> prompt reappears. The SELECT procedure is complete.

Using SELECT on a hard disk

1. Insert your system diskette containing the SELECT program in drive A.

2. At the A) prompt, type the following and press **Enter**:

   ```
   SELECT A: C: ØØ1 US
   ```

   The screen displays this message:

   ```
   SELECT is used to install DOS the first
   time. SELECT erases everything on the
   specified target and then installs DOS.
   Do you want to continue (Y/N)?
   ```

3. If your hard disk is new and has no files stored on the DOS partition, press **Y**. Or press **N** to cancel the procedure. If the hard disk contains files, see the note at the end of these instructions.

   If you pressed **N**, the A) prompt redisplays. If you pressed **Y**, formatting does not begin immediately. You still have one more chance to change your mind. The screen displays the following:

   ```
   WARNING, ALL DATA ON NON-REMOVABLE DISK
   DRIVE C: WILL BE LOST!
   Proceed with Format (Y/N)?
   ```

4. Press **Y** to format the DOS partition, *erasing* any stored files, or press **N** to cancel the procedure. Then press **Enter**. If you pressed **N**, the A) prompt reappears. If you pressed **Y**, MS-DOS begins formatting your hard disk's DOS partition. The screen continuously displays the changing head and cylinder numbers.

   Besides formatting the hard disk partition, MS-DOS also copies the operating system files to the hard disk. When the procedure is complete, you see the following:

   ```
   Format complete
   System transferred
   Volume label (11 characters, ENTER for
   none)?
   ```

5. If you want to label the hard disk, type a name of up to 11 characters and press **Enter**. If you do not want to name the hard disk, do not enter any characters. Just press **Enter**. The screen first displays disk space information and then displays the following message:

```
Reading source file(s)...
```

At this point, MS-DOS copies all the files from the DOS diskette to the hard disk. The file names appear on the screen as they are copied to the hard disk.

When all the files are copied, the `A>` prompt reappears. The SELECT procedure is complete.

Note

If the hard disk contains files in the DOS partition, the screen displays this message:

```
Enter current Volume Label for drive C:
```

Enter the volume label currently assigned to drive C and press **Enter**. If you do not enter the proper volume label, the screen displays this message:

```
Invalid Volume ID
Format failure
```

The `A>` prompt appears on the screen. Type `C:` and press **Enter**. Then type `VOL` and press **Enter**. The screen displays this message:

```
Volume in drive C is name
```

Note the name of the volume. Then type `A:` and press **Enter**. At this point, return to step 2 in the instructions above and complete the procedure from that point. When the program prompts you for the volume label, type the name.

Example

To use SELECT to configure your system for use in the United Kingdom, type the following and press **Enter**:

```
SELECT A: C: 044 UK
```

MS-DOS creates the CONFIG.SYS file with this information:

```
COUNTRY=044, 437
```

MS-DOS also creates the following AUTOEXEC.BAT file:

```
PATH \;
KEYB UK 437 C:\KEYBOARD.SYS
ECHO OFF
CLS
DATE
TIME
VER
```

SET

Internal

Purpose

Sets or displays the environment string values in memory.

Format

SET [*name*=[*parameter*]]

Description

Use SET to insert a string into the command processor's environment or to set one string equal to another. A copy of the entire series of strings in the environment is made available to all commands and applications. SET also displays the current setting of environment strings.

SET inserts the entire string, beginning with *name*, into a block of memory reserved for environment strings. Any lowercase letters in the name are converted to uppercase letters when added to the environment (including foreign language characters). The remainder of the line is inserted as typed. If the name already exists in the environment, it is replaced with the new parameter.

If you enter SET only with no *name*, the current setting of environment strings is displayed.

If you specify a *name* but no *parameter*, SET removes the current setting of *name*=*parameter* from the environment.

Do *not* use SET to add the PROMPT and PATH commands to the environment. MS-DOS automatically does this when these commands are entered.

One of the strings in the environment is always a COMSPEC=*parameter*. (MS-DOS places it in the environment when you start or reset your system.) This parameter describes the path that MS-DOS uses to reload the command processor when necessary.

You can use the SET command in batch processing and define your replaceable parameters with names instead of numbers. This eliminates the need to change replaceable parameter names in each batch file.

Examples

To add the string PROG=\LEVEL1 to the environment, type the following and press **Enter**:

```
SET PROG=\LEVEL1
```

In the above example, when an application program receives control, it could search the environment for the name PROG and use the supplied parameter as the directory name to use for its files.

To remove PROG=\LEVEL1 from the environment, type the following and press **Enter**:

```
SET PROG=
```

To add the string ABC=xyz to other strings already in the environment, type the following and press **Enter**:

```
SET ABC=xyz
```

In the above example, you can enter keywords and parameters that have no meaning in MS-DOS, but can be found and interpreted by applications designed to examine the environment.

SHARE

External

Purpose

Installs file sharing and locking protection in network situations.

Format

`[d:][path]SHARE [/F:space][/L:locks]`

Description

You can use the SHARE command only when networking is active. You normally include the command in an AUTOEXEC.BAT file to install shared files. See the manual for your networking software to learn about shared files.

You can use these switches with SHARE:

Switch	*Function*
/F:*space*	Allocates file space
/L:*locks*	Allocates the number of locks

Use the /F switch to allocate file space (in bytes) for the area MS-DOS uses to record file sharing information. The space required for each open file is the length of the full filename plus 11 bytes. The default value is 2048 bytes.

The /L switch allocates the number of file locks. The default is 20 locks.

Once you use the SHARE command in an MS-DOS session, all read and write requests are checked by MS-DOS against the allowed number of FCBs specified in your CONFIG.SYS file. If you try to load SHARE again, the following message is displayed:

```
Share Already Installed
```

Example

To reserve 1500 bytes for file sharing and allow for 10 locks, type the following and press **Enter**:

```
SHARE /F:1500/L:10
```

SORT

External (filter)

Purpose

Sorts data from an input device and then writes it to the output device, such as a screen, file, or printer.

Format

`[d:][path]SORT [/R][⟨filename [⟩filename]] [/+n]`

Description

SORT is a filter program that reads input from your keyboard (or standard input device), sorts the data, and then writes it back to your monitor (or standard output device).

You can use SORT to arrange a file in ASCII code order. This means that numbers come before letters and that all uppercase letters come before all lowercase letters. For example, *Z* comes before *a*.

You can redirect your input and output to sort the data in a file and then write the sorted data to a new output file or system device.

You can use two switches with SORT:

Switch	*Function*
/R	Reverses the sort order; output sorts in order from Z to A
/+*n*	Starts sorting in column *n*; SORT normally begins sorting in column 1

The output file must be different than the input file.

Examples

To read the file UNSORT.TXT, reverse the sort, and then write the output to a file named SORT.TXT, type the following and press **Enter**:

```
SORT /R ⟨UNSORT.TXT⟩ SORT.TXT
```

You can combine SORT with other commands. For example, to sort the output of the DIR command starting in column 14, and display output on your screen, type the following and press **Enter**:

```
DIR ¦ SORT /+14
```

The result of this command is a directory sorted by file size (represented in column 14).

You can add the MORE command to SORT. To read your sorted directory one screen at a time, type the following and press **Enter**:

```
DIR ¦ SORT /+14 ¦ MORE
```

SUBST *External*

Purpose

Substitutes a drive letter for a pathname.

Format

`[d:][path]SUBST`

`[d:][path]SUBST d1: [d2:]path`

`[d:][path]SUBST d: /D`

Description

Use SUBST to substitute a single drive letter for an entire pathname. This is useful if you use application programs that do not allow pathnames. With these programs, all disk activity must take place in the current directory. To get around this limitation, use the SUBST command.

The drive letters you can use with SUBST depend on the value of LASTDRIVE in the CONFIG.SYS file. If a CONFIG.SYS file does not exist or does not contain the LASTDRIVE parameter, the default value is E. In this case, any letter from A to E can be used by SUBST. If you use a lot of substitutions, increase the value of LASTDRIVE. (See Chapter 6 for a complete description of the CONFIG.SYS file.)

Even though you can use any letter in the range, do not use the letter assigned to an existing drive. If you do use an existing drive, the specifier will no longer refer to the drive but to the path instead.

In the command format above, *d1:* represents the letter assigned to the pathname. *d2:* must not be the same as the default drive. Specify *d2:* only if the pathname is on a different drive. The pathname must start from the root directory.

Type SUBST without any parameters to display the current substitutions.

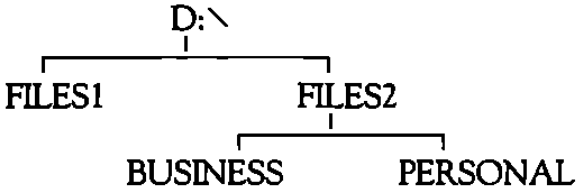
Use the /D switch to cancel a substitution. If more than one substitution has been made, use SUBST *d:*/D to cancel each value of *d:*.

Caution

Do not use ASSIGN, BACKUP, DISKCOMP, DISKCOPY, FDISK, FORMAT, JOIN, LABEL, RESTORE, or SELECT while a substitution is in effect.

Examples

Assume the following directory structure for drive D:



If you are running the application program from drive C (a hard disk), to access the path D:\FILES1, substituting the letter E, type the following and press **Enter**:

```
SUBST E: D:\FILES1
```

If you log on or refer to drive E from your application program, all activity takes place through the path D:\FILES1.

To cancel this substitution, type the following and press **Enter**:

```
SUBST E: /D
```

To access the path D:\FILES2\PERSONAL, substituting the letter F, type the following and press **Enter**:

```
SUBST F: D:\FILES2\PERSONAL
```

SYS

External

Purpose

Copies the system files from the boot-up drive to the specified disk.

Format

`[d:][path]SYS d:`

Description

Use SYS to transfer MS-DOS system files from the disk in the boot-up drive (the one from which you loaded MS-DOS) to the diskette or hard disk you specify. The system files are hidden and do not appear when you give the DIR command. The SYS command can either update an earlier version of MS-DOS on a disk or copy the system to a formatted disk containing no files.

SYS does not transfer COMMAND.COM, the command processor. You must use the COPY command to transfer COMMAND.COM into the destination disk's root directory.

You must include the drive descriptor in the command, and it must be different than the boot-up drive. Prompts tell you when to change diskettes. The destination diskette must be formatted.

This command may not work in a network environment.

Example

To copy the system files from the disk in the boot-up drive to the disk in drive B, type `SYS B:` and press **Enter**. You see the message `System transferred.`

TIME

Internal

Purpose

Displays or sets the system time.

Format

```
TIME [hh:mm[:ss[.cc]]]
```

Description

Use TIME to set a new system time. The file directory then records the time on all files when you create or modify them.

The TIME command updates the CMOS time if your computer has a real-time clock.

To display the current system time, type TIME and press Enter. A message similar to this appears:

```
Current time is Ø9:11:19.7Ø
Enter new time: _
```

Press Enter if you do not want to change the current time. Or, enter a different time and then press Enter. MS-DOS redisplays the command prompt.

Enter the time using numbers only. MS-DOS uses a 24-hour clock, so the numbers must be in the following ranges:

- *hh* must be from 00 to 23
- *mm* must be from 00 to 59
- *ss* must be from 00 to 59 (optional)
- *cc* must be from 00 to 99 (optional)

You must separate the hour and minute entries with a colon. If you enter seconds, precede the number with a colon. If you enter hundredths of seconds, precede the number with a period.

You can change the format of the time display with the COUNTRY command in your CONFIG.SYS file.

Examples

To set the time for 9:30 in the morning, you can type any one of the following:

```
9:30:00
9:30
09:30:00
09:30
```

To set the time for 11:35 in the evening, type either of the following:

```
23:35
23:35:00
```

TREE

External

Purpose

Displays the complete subdirectory tree structure of a disk.

Format

`[d:][path]TREE [d:][/F]`

Description

Use TREE to display the complete directory tree of a disk, and, optionally, list all the files contained in the subdirectories.

For each directory path, TREE displays the subdirectories that branch from it. TREE displays all files within the directory path if you use the /F switch.

Type TREE to see the subdirectory structure of the default drive. To see the subdirectory structure of a different drive, type TREE and the drive descriptor.

When subdirectories are present, TREE lists them by path and subdirectory, in the order they were created. The heading for this display is the following:

```
DIRECTORY PATH LISTING
```

If your disk has a volume label, TREE includes the label in the heading. If it has no label, TREE substitutes question marks on the display.

Use Ctrl S to halt the scroll of the subdirectories and files on the screen. You can also use the MORE filter.

Examples

To see a list of subdirectories, type the following and press Enter:

```
TREE
```

TREE displays a report similar to this one:

```
Path: \LEDGER
```

```
Sub-directories: ACCREC
                 ACCPAY
                 SALES
```

To see a list of all the files in the subdirectories, type the following and press **Enter**:

```
TREE /F
```

TREE displays a report similar to this one:

```
Path: \LEDGER

Sub-directories: ACCREC
                 ACCPAY
                 SALES

Files            BILLS1
                 INVOICE.JUN
                 INVOICE.JUL
```

To send the output of the above to a printer, type the following and press **Enter**:

```
TREE /F >PRN
```

TYPE

Internal

Purpose

Displays the contents of a file on your screen.

Format

`TYPE [d:][path]filename`

Description

Use TYPE to display the contents of a file without modifying it. You must specify a filename and you cannot use wildcard characters. The specified file is displayed on the screen or the standard output device.

When you use TYPE, data is unformatted. Normal tabs expand and are shown at every eighth column. Some word processors embed tabs instead of spaces to save disk space.

The TYPE command is meaningful only with text files. If you give the TYPE command for a binary file, you may see strange characters that represent control characters such as bells, form feeds, and escape sequences.

You can use the MORE command to display the file one screen at a time, and you can press **Ctrl Print Screen** to print the file as it appears.

Examples

To display a file on drive B called EPSON.TXT, type the following and press **Enter**:

```
TYPE B:EPSON.TXT
```

To print a file named TICKET in the current directory while it displays on the screen, press **Ctrl P**. Then type the following and press **Enter**:

```
TYPE TICKET
```

VER

Internal

Purpose

Displays the MS-DOS version number.

Format

VER

Description

Use the VER command to find out which version of MS-DOS you are using. MS-DOS displays the version number on your screen.

Example

To display the version of MS-DOS you are using, type VER and press **Enter**. You see a message similar to this:

```
MS-DOS Version 3.30
```

VERIFY

Internal

Purpose

Turns on or off the verify function, which verifies each disk write.

Format

```
VERIFY [ON]
VERIFY [OFF]
```

Description

Use VERIFY to verify that all your files are written correctly to disk. When you specify VERIFY ON, MS-DOS checks that the disk controller did not err during the disk writing procedure. This command, however, does not guarantee that the data is correct. MS-DOS normally performs VERIFY every time you write data to a disk.

The /V switch with the COPY or XCOPY command performs the same function as VERIFY ON.

When you set VERIFY ON, it remains in effect until you turn it off or reset or turn off the computer. When VERIFY is on, MS-DOS takes a little longer when writing to disk.

You can display the current setting of VERIFY by typing VERIFY, with no parameters.

Examples

To verify that data written to disk is correctly recorded, type the following and press **Enter**:

```
VERIFY ON
```

To display the current setting, type the following and press **Enter**:

```
VERIFY
```

If you had set VERIFY ON, the screen displays the following:

```
VERIFY is on
```

VOL

Internal

Purpose

Displays a disk volume label.

Format

```
VOL [d:]
```

Description

Use VOL to display the volume label of the disk in drive *d*, if the volume label exists. If you do not specify a disk drive descriptor, VOL displays the volume label of the disk in the default drive.

If the disk has no label, the screen displays this message:

```
Volume in drive d has no label
```

You can use LABEL or XTREE (described in Chapter 5) to create or rename the volume label of a disk.

Example

To see the volume label of a diskette in drive B, type the following and press **Enter**:

```
VOL B:
```

The screen displays a message similar to this:

```
Volume in drive B is DATAFILESØØ1
```

XCOPY

External

Purpose

Selectively copies files and, optionally, subdirectories.

Format

```
[d:][path]XCOPY [d1:][path]filename
                [d2:][path][filename]
                [/A][/E][/M][/P][/S][/V][/W]
                [/D:date]
```

Description

Use the XCOPY command to copy:

- Individual files from one disk to another or to the same disk
- A group of files by indicating a path or using wildcard characters
- One or more files under new names.

Note

An easier way to use the XCOPY command is through the MENU utility. See Chapter 5 for instructions.

XCOPY differs from COPY in that you can copy subdirectories and, if necessary, create them as you copy.

Use XCOPY instead of DISKCOPY if you are copying all the files from one disk to another that is not the same media (from a 360KB diskette to a 1.2MB diskette, for example). Because DISKCOPY copies all the data by tracks, it cannot copy between two disks that are not the same format.

In the command format above, *d1* is the source and *d2* is the target. You must specify at least a drive, path, or filename for the source.

If you do not specify a path for the source diskette, XCOPY starts from the current directory. The *filename* can be a single file or a group of files

(indicated by wildcards * or ?). If you do not include a filename on the source diskette, XCOPY assumes *.* and copies all files.

If you do not specify a path for the target copies, XCOPY copies the files to the current directory. If you do not include a filename, or if you enter *.*, the target copies have the same name as the source files.

You can use the following switches with XCOPY to select exactly which files to copy and how they should be copied:

Switch	*Function*
/A	Copies files whose archive bit is set, but does not change the attribute of the *source* file.
/E	When used with /S, creates subdirectories on the target even if no files are stored in them.
/M	Copies files whose archive bit is set but, unlike /A, turns off the archive bit of the *source* file.
/P	Prompts you to reply Yes or No before copying each file.
/S	Copies files from the source directory and from all the subdirectories below the source directory. /S creates subdirectories on the target as it copies files, but does not create a subdirectory that contains no files. To do this, use /E as well as /S.
/V	Verifies that the sectors written on the target diskette are recorded properly: /V causes XCOPY to run slower.
/W	Tells XCOPY to wait for you to insert diskettes before beginning to search for source files.
/D:*date*	Copies files whose date is the same as or later than the specified date. (Date format depends on the COUNTRY code selected.)

You can give a file a new name with XCOPY by specifying a target filename that is different than the source filename.

You cannot use XCOPY to copy from or to the reserved device names, CON and LPT1.

XCOPY sets the following exit codes (which you can use in error-detection batch processing):

0 Normal completion of command

1 No files were found to copy

2 Terminated by user (Ctrl C, Ctrl BREAK, etc.)

3 General error

4 INT 24 error

Examples

To copy all the files in all the subdirectories of drive C to drive A, type the following and press Enter:

```
XCOPY C:\ A:\ /S
```

XCOPY copies all the files, creating subdirectories as required.

If drive C contains some subdirectories with no files in them, and you want those subdirectories to be created on drive A along with the other subdirectories, type the following and press Enter:

```
XCOPY C:\ A:\ /S/E
```

To copy all files in the \WORK subdirectory modified on or after March 15, 1988 to drive A, type the following and press Enter:

```
XCOPY C:\WORK A:/D:Ø3-15-88
```

Chapter 5

Epson Menu Utilities

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Introduction

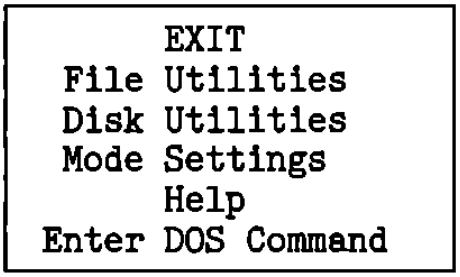
Epson has included these menu utilities to make MS-DOS easier to use:

- MENU provides simplified menu screens that make it easier to run certain complex MS-DOS commands.
- SETPRINT displays a menu through which you can control your printer's operation and select alternate typefaces and spacing values.
- XTREE lets you manage your files and directories through a menu of integrated MS-DOS commands.

This chapter describes how to use the MENU, SETPRINT, and XTREE programs and also explains how to run XTREEINS if you are having trouble displaying XTREE on your screen.

MENU

The MENU program displays a menu from which you can select any MS-DOS command, and it provides simple menus for running certain complex commands. To run the program, log onto the directory containing the MENU program or enter the correct pathname and then type MENU and press **Enter**. The screen displays this main menu:



Each option in the main menu (except EXIT and Enter DOS command) displays a submenu of MS-DOS functions. Use ↑ or ↓ to move the highlighted cursor block to the desired option. Then press **Enter** to display that submenu. Select the EXIT option when you want to leave the menu utility.

Each option in the submenus corresponds to an Epson program and/or an MS-DOS command. Table 5-1 shows which commands are activated by the options in the menus.

Table 5-1. MENU commands

Main menu	Submenu option	Epson program	MS-DOS command
File Utilities	Backup Files	SETBCKUP	BACKUP
	Restore Files	SETRSTOR	RESTORE
	Replace Files	SETRPLCE	REPLACE
	Compare Files	SETFC	FC
	Change File Attributes	SETATTR	ATTRIB
	Copy Files/ Directories	SETXCOPY	XCOPY
Disk Utilities	Check Disk	DU	CHKDSK
	Disk Copy	DU	DISKCOPY
	Disk Compare	DU	DISKCOMP
	Format Disk	DU	FORMAT
Mode Settings		SETMODE	MODE
Help			HELP
Enter DOS Command			any MS-DOS command

For example, if you select Backup Files from the File Utilities submenu, MENU calls up an Epson-created program named SETBCKUP. This program then calls up and runs the MS-DOS BACKUP command, but it does so by displaying a series of menus on the screen from which you select options to control the BACKUP command.

This structure means you can run the BACKUP command in one of three ways:

- Type BACKUP at the MS-DOS command prompt, with all the appropriate parameters and switches. For instructions, see the BACKUP command in Chapter 4.

- Run the MENU program, select the File Utilities option, and then select the Backup Files option. This lets you run the BACKUP program by selecting options from the menus provided by SETBCKUP.
- Type SETBCKUP at the MS-DOS command prompt. This lets you run BACKUP through the SETBCKUP program (selecting options from menus) without going through the MENU program.

Because of this structure, when you run the MENU program you need to be sure it can find the appropriate Epson and MS-DOS commands (programs). If you have a hard disk, it is best to store MENU and all the necessary programs in one directory. If you do not have a hard disk, do one of the following:

- If your computer has a 1.2MB, 1.44MB, or a 720KB diskette drive, store MENU and all the necessary programs on one diskette. Then use this diskette whenever you run MENU.
- If your computer has only one or two 360KB diskette drives, use the following PATH command before you run the MENU program:

  ```
  PATH B:
  ```

  Then, when you run the MENU program and request an option that requires an MS-DOS command, the screen prompts you to insert the diskette for drive B. At this point, insert the diskette containing the program you want to use—in drive A if you have only one drive or drive B if you have two—and press any key to continue. Be sure to insert the correct diskette; otherwise, MENU displays an error message and you will not be able to complete the operation.

  When MENU finishes using the program, the screen prompts you to insert the diskette for drive A. If you have one drive, replace the diskette in drive A with the diskette that contains MENU. Press any key to continue.

With this method, you need to know exactly which programs are on which diskettes. You may want to keep a printout of the disks' directories for reference. (You can print the directory of a disk by pressing **Ctrl P** before giving the DIR command.)

If your work sessions involve a lot of disk handling, or you just want to keep things simple, it's a good idea to use this convenient menu program—alone or within a batch file. You can include MENU in a batch file just like any other MS-DOS command.

The instructions below first provide general rules for selecting options from the menus and then describe each of the MENU options separately. If you want to learn more about a particular menu option, see the description of the corresponding MS-DOS command in Chapter 4.

Selecting options from menus

Although each menu offers different options, the procedure for selecting options is the same, and each screen in the MENU program tells you what you need to do.

The key functions for controlling a menu appear in the bottom part of every menu screen. For example, the main menu displays the following prompt:

```
↓ Selects Function  Enter Exits Program
```

This tells you to press ↓ to move the cursor block to the option you want to select or press **Enter** to activate the selected option (Exit, in this case).

The following message also appears on the main menu:

```
Use the PgUp and PgDn keys to move this Help Text
up and down one line.
```

Every menu screen provides help information in this bottom part of the screen about the option currently selected by the cursor block. If there is more text than can fit in these five lines, press **PgUp** to move the help information up to display more text; then press **PgDn** if you want to

read the previous text or to go back to the top of the help text. You can use **PgUp** and **PgDn** on any of the submenus to read about the selected option.

Check this part of the screen whenever you need information about the command or what key to press.

When a submenu for a utility (such as BACKUP) is on the screen, the name of the command is in the upper left corner, such as this:

```
BACKUP Utility
```

When a utility menu is on the screen, you often need to choose one of two possible parameters for an option by pressing the **Enter** key. This switches the selection back and forth between the first choice and the second—YES and NO, for example. When the desired choice appears, press ↑ or ↓ to move the cursor block to another option.

If a particular option requires you to type in some information—the name of a file, for example—you must type something before you can move on to the next option. This prevents you from leaving out information that the command needs to work properly. Press the **Insert** key to turn on or off TYPEOVER mode when typing in this information. You can use the backspace key and the **Delete** key to correct text you type.

As you select options from a utility menu, the MS-DOS command string appears below the menu to show you how this command would appear if you were typing it at the command prompt. For example, the command string for a BACKUP command might look like this:

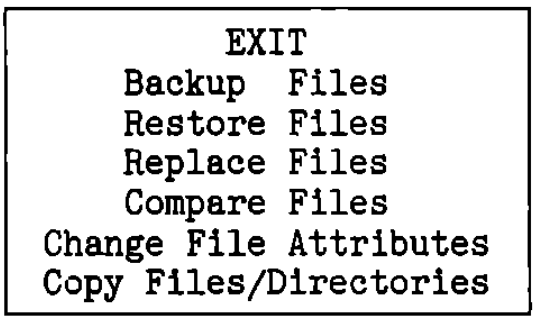
```
COMMAND STRING > BACKUP C:\*.* A:/S
```

When you want to leave the displayed menu, just keep pressing ↑ until the cursor block is on the EXIT option; then press **Enter**. You can also press the **Esc** key to return to the previous menu.

Select the option you want from the main menu, then go to the description of that function below for instructions on using it.

File Utilities

When you select the File Utilities option from the main menu, the screen displays these options:



Move the cursor block to the option you want and press **Enter**. Then follow the appropriate instructions below for that option.

Backup Files

The Backup Files option lets you back up (copy) files from one disk to another—most typically, from a hard disk to diskettes—to protect your data. This command is different from the COPY command in that it copies the files in a condensed format that requires less storage space. You cannot access files that have been copied with the Backup Files option, but you can copy them back to the original disk with the Restore Files option and then access them.

This option runs the MS-DOS BACKUP program.

When you select the Backup Files option, the screen displays this menu:

```
                    EXIT
  Source        =
  Target Drive =    :
   NO       Include Subdirectory Files
   NO       Include Only Modified Files
   NO       Add Files Without Replacing
   NO       Select A Starting Date
   NO       Select A Starting Time
   NO       Format The Target Disk Before Backup
   NO       Specify A Log File =
************ S T A R T   B A C K U P ***********
```

You must enter the appropriate information for the first two items in this menu. The rest of the options offer a choice between NO or YES; you can either accept the default (NO) or press **Enter** to change the parameter to YES. Use the BACKUP options as follows:

Source—Type the drive letter, pathname, and filename of the file or files you want to back up. You can use wildcards to select groups of files. For example, to back up all files on drive C in the \LETTERS directory, you would type:

```
C:\LETTERS\*.*
```

Target Drive—Type the letter of the drive containing the target disk (which is usually A).

Include Subdirectory Files—If you want to include all the files in any subdirectories that exist in the specified pathname, select YES.

Include Only Modified Files—If you want to include only those files that have been modified since the last time BACKUP was used on this disk, select YES.

Add Files Without Replacing—If you want to add only new files, and not replace those already existing on the target disk, select YES.

Select A Starting Date—If you want to back up all files that have been created or modified beginning from a certain date, select YES. A small box appears on the right side of the menu with this prompt (for the United States):

```
MM-DD-YYYY
```

Enter the date in this format—two digits each for the month and day and four digits for the year. (The format depends on the COUNTRY command in your CONFIG.SYS file.) You do not enter the dashes. For example, for June 22, 1988 you would type:

```
06221988
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid date (more than 12 for the month or 31 for the day), you must reenter the date.

Select A Starting Time—If you want to back up all files that have been created or modified beginning from a certain time, select YES. A small box appears on the right side of the menu with this prompt:

```
HH:MM:SS
```

Enter the time in this format (two digits each for the hour, minutes, and seconds) using the 24-hour clock, but do not type the colons. For example, to select 9:30 a.m., you would type:

```
093000
```

To select 4:15 p.m., you would type:

```
161500
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid time (more than 23 for the hour or 59 for the minutes or seconds), the cursor does not go back to the large menu and you must reenter the time.

Format the Target Disk Before Backup—If the disk you are copying the files to has not been formatted, select YES; otherwise, leave the default to NO for this option.

Specify A Log File—If you want to create a file on the source disk that lists the names of all the backup files, select YES. This creates a file you can read and print like any text file. The log file is given the default name of BACKUP.LOG unless you enter a different one. To change it, enter a name consisting of up to eight characters for the name (and up to three characters for the extension, if desired). You can store the log file on another disk, as long as it is not the target disk. Just specify the desired drive before the filename.

When you have made your selections, move the cursor block down to START BACKUP and press **Enter** to begin the backup procedure. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The screen prompts you to insert backup diskette 01 (the first diskette) in the target drive and press any key when ready. The program copies the files from the source disk to the target disk and displays the filenames on the screen as they are copied.

If the first disk fills up, the screen prompts you to insert backup diskette 02. Follow the prompts on the screen until all the files have been backed up. Then the screen prompts you to press any key to continue, and the Backup Files menu reappears. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Restore Files

Use this option when you want to restore files that have been backed up with the Backup Files option (or the BACKUP command).

This option runs the MS-DOS RESTORE program.

When you select the Restore Files option, the screen displays this menu:

```
                    EXIT
   Source Drive =  :
   Target       =
   NO         Include Subdirectory Files
   NO         Prompt Before Restoring
   NO         Restore Files Before A Date
   NO         Restore Files After A Date
   NO         Include Only Modified and Deleted Files
   NO         Include Only Files Not On The Target
   NO         Restore Files Later Than A Time
   NO         Restore Files Earlier Than A Time
********** S T A R T   R E S T O R E **********
```

You must enter the appropriate information for the first two items in this menu. The rest of the options offer a choice between NO or YES; you can either accept the default (NO) or press **Enter** to change the parameter to YES. Use the RESTORE options as follows:

Source Drive—Type the letter of the drive containing the source disk (the disk containing the files you want to restore to the target disk).

Target—Type the drive letter and pathname on the target disk to which you want to restore the files from the source disk. You can use wildcards to identify a group of files. For example, to restore the files to drive C in the \SALES directory, you would type:

```
C:\SALES\*.*
```

Include Subdirectory Files—If you want to include all the files in any subdirectories that exist in the specified pathname, select YES.

Prompt Before Restoring—If you want the program to ask you whether you want to restore modified or read-only files, select YES. With this option selected, a prompt appears before each file is copied so you can choose whether or not to copy it.

Restore Files Before A Date—If you want to restore only those files that were modified on or before a specified date, select YES. A small box appears on the right side of the menu with this prompt (for the United States):

```
MM-DD-YYYY
```

Enter the date in this format—two digits each for the month and day and four digits for the year. (The format depends on the COUNTRY command in your CONFIG.SYS file.) You do not enter the dashes. For example, for May 16, 1988 you would type:

```
05161988
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid date (more than 12 for the month or 31 for the day), you must reenter the date.

Restore Files After A Date—If you want to restore only those files that were modified on or after a specified date, select YES. A small box appears on the right side of the menu with this prompt (for the United States):

```
MM-DD-YYYY
```

Enter the date in this format—two digits each for the month and day and four digits for the year. (The format depends on the COUNTRY command in your CONFIG.SYS file.) You do not enter the dashes. For example, for June 22, 1988 you would type:

```
06221988
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid date (more than 12 for the month or 31 for the day), you must reenter the date.

Include Only Modified and Deleted Files—If you want to include only those files on the target disk that have been modified or deleted since the last time BACKUP was used on this disk, select YES.

Include Only Files Not On The Target—If you want to restore only those files that exist on the source disk but not on the target—select YES.

Restore Files Later Than A Time—If you want to restore only those files that have been modified at or after a certain time, select YES. A small box appears on the right side of the menu with this prompt:

```
HH:MM:SS
```

Enter the time in this format (two digits each for the hour, minutes, and seconds) using the 24-hour clock, but do not type the colons. For example, to select 11:00 a.m., you would type:

```
110000
```

To select 8:30 p.m., you would type:

```
203000
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid time (more than 23 for the hour or 59 for the minutes or seconds), you must reenter it.

Restore Files Earlier Than A Time—If you want to restore only those files that have been modified at or before a certain time, select YES. A small box appears on the right side of the menu with this prompt:

```
HH:MM:SS
```

Enter the time in this format (two digits each for the hour, minutes, and seconds) using the 24-hour clock, but do not type the colons. For example, to select 7:30 a.m., you would type:

```
073000
```

To select 6:50 p.m., you would type:

```
185000
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid time (more than 23 for the hour or 59 for the minutes or seconds), you must reenter it.

When you have made your selections, move the cursor block down to START RESTORE and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The screen prompts you to insert backup diskette 01 (the first diskette) in the source drive and press any key when ready. The program copies the files from the source disk to the target disk and displays the filenames on the screen as they are copied. The screen also displays the date the files were backed up.

After all the files on the first disk have been copied, the screen prompts you to insert backup diskette 02, if necessary. Follow the screen prompts until all the files have been restored. Then press any key to return to the Restore Files menu. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Replace Files

The Replace Files option replaces a file or group of files on the target disk with those from the source disk that have the same name, and displays the filenames on the screen as they are replaced. You can also add files from the source disk that do not exist on the target disk. You cannot replace hidden files or system files.

This option runs the MS-DOS REPLACE program.

When you select the Replace Files option, the screen displays this menu:

```
                    EXIT
    Source =
    Target =
     NO      Add Files Not On The Target
     NO      Prompt Before Replacing or Adding Files
     NO      Overwrite Read-Only Files
     NO      Search All Directories
     NO      Pause Before Beginning
  ********** S T A R T   R E P L A C E **********
```

You must enter the appropriate information for the first two items in this menu. The rest of the options offer a choice between NO or YES; you can either accept the default (NO) or press **Enter** to change the parameter to YES. Use the Replace Files options as follows:

Source—Type the drive letter, pathname, and filename of the file or files on the source disk. These will replace matching files on the target disk. You can use wildcards to identify a group of files. For example, to select the files from drive A in the \LETTERS directory that have the extension .NEW, you would type:

```
A:\LETTERS\*.NEW
```

Target—Type the drive letter and pathname for the files you want to be replaced on the target disk. For example, to replace the files on drive C in the \LETTERS directory you would type:

```
C:\LETTERS
```

Add Files Not On The Target—If you only want to add files from the source disk that do not exist on the target disk, select YES. This option adds new files but does not replace existing ones. You cannot select both this option and the Search All Directories option; choose one or the other.

Prompt Before Replacing or Adding Files—If you want the program to prompt you to respond Yes or No for each file before replacing (or not replacing) it select YES.

Overwrite Read-Only Files—If you want files on the source diskette to replace matching files on the target disk that are set to be read-only, select YES. (You can set a file as read-only with the Change File Attributes option—see below—or the ATTRIB command.)

Search All Directories—If you want the files on the source diskette to replace matching files in all subdirectories of the target directory, select YES. You cannot select both this option and the Add Files Not On The Target option; choose one or the other.

Pause Before Beginning—If you want the program to pause before it starts so you can insert the source diskette, select YES.

When you have made your selections, move the cursor block down to START REPLACE and press **Enter** to begin replacing files. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The program replaces the files on the target disk with those from the source disk that have the same name, and displays the filenames on the screen as they are replaced. Then the screen prompts you to press any key to continue, and the Replace Files menu reappears. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Compare Files

Use the Compare Files option to compare the contents of two files. This option shows you exactly what the differences are, and you can output the results to either the screen or to another file. The files can be either text files or binary files.

This option runs the MS-DOS FC program.

Note

If you just want to know if two files are different and are not concerned about exactly how, you may want to use the COMP (compare) command instead. See COMP in Chapter 4 for instructions.

When you select the Compare Files option, this menu appears:

```
                    EXIT
Filename1 =
Filename2 =
NO        Abbreviate the Output
NO        Force a Binary Comparison
NO        Ignore the Case of Letters
NO        Force a DOS Text File Comparison
NO        Display Line Numbers
NO        Compress Tabs Only
NO        Compress Tabs and Spaces
NO        Reset the Internal Line Buffer
NO        Specify Number of Matching Lines
YES       Output to the Screen :
************ S T A R T     F C ************
```

You must enter the exact filenames for the first two items in this menu. The rest of the options offer a choice between NO or YES; you can either accept the default or press **Enter** to change the parameter. Use the Compare Files options as follows:

Filename1—Type the drive letter, pathname, and filename for the first file.

Filename2—Type the drive letter, pathname, and filename for the second file.

Abbreviate the Output—If you want to see only the first and last lines of each section of text that is different, select YES.

Force a Binary Comparison—Any file with the extension .EXE, .COM, .SYS, .OBJ, .LIB, or .BIN automatically receives a binary comparison. If you want to force a binary comparison on another type of file, select YES for this option.

Ignore the Case of Letters—If you want the comparison to ignore whether letters are uppercase or lowercase, select YES.

Force a DOS Text File Comparison—Any standard DOS text file automatically receives an ASCII comparison. If you want to perform an ASCII comparison on a system file (one with the extension .EXE, .COM, .SYS, .OBJ, .LIB, or .BIN), select YES for this option.

Display Line Numbers—This option assigns a line number for each line of text in the two files. If you want to see the line numbers for the files as they are compared, select YES. You cannot use this option if you are comparing binary files.

Compress Tabs Only—Normally, the comparison expands tabs to eight spaces. If you want to compress each tab to only one space, select YES.

Compress Tabs and Spaces—If you want to compress both tabs and contiguous blank spaces to a single space, select YES.

Reset the Internal Line Buffer—If the program finds more than 100 lines in the two files that are different, it aborts the comparison. You can use this option to define a different value for the internal line buffer. First select YES to reset the buffer. A small box appears to the right of the menu. Type the number of lines you want to be the maximum amount of differing lines before the comparison is aborted, from 1 through 999. Press **Enter**.

Specify Number of Matching Lines—Normally, the program expects to find at least two lines that are the same after finding a difference to continue the comparison. If you want to specify a different number, press **Enter**. A small box appears to the right of the menu. Type the number (from 1 through 9) you want to be the minimum amount of matching lines for the comparison and press **Enter**.

Output to the Screen—If you want the comparison to be recorded to a file or a printer instead of on the screen, select NO. Then type a name for the file to be created or the device name for the printer, including the drive letter and pathname if necessary.

When you have made your selections, move the cursor block down to START FC and press **Enter** to begin replacing files. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The program compares the two files and displays information about them on the screen (or stores the information in a file if you chose to output to a file). Then the screen prompts you to press any key to continue, and the Compare Files menu reappears. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Change File Attributes

Use the Change File Attributes option to change the read-only attribute or archive bit of a file or group of files. When you set a file to read-only, it can be read, but cannot be altered or deleted. The archive bit tells MS-DOS if a file has been altered so commands such as BACKUP and XCOPY know whether to copy it.

This option runs the MS-DOS ATTRIB program.

When you select the Change File Attributes option, the screen displays this menu:

```
                    EXIT
Filename  =
No Change   Read-Only Attribute
No Change   Archive Attribute
  NO        Include All Subdirectory Files
 ******* S T A R T   A T T R I B ******
```

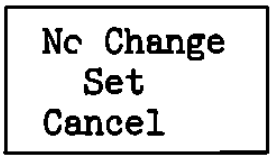
Use the Change File Attributes options as follows:

Filename—Type the drive letter, pathname, and filename of the file or files whose attributes you want to change. You can use wildcards to identify a group of files. For example, to select all files on drive B in the \SALES directory that have the extension .87, you would type:

```
B:\SALES\*.87
```

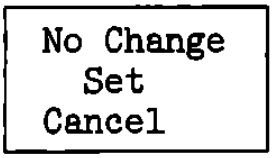
Read-Only Attribute—If you want to change the read-only attribute of the specified file or files, move the cursor to this item and press **Enter**.

A small box appears to the right of the menu with these options:



To turn the read-only attribute on, move the cursor to Set. To turn the attribute off, move the cursor to Cancel. Select No Change if you don't want to change anything. Press **Enter**.

Archive Attribute—If you want to change the archive attribute of the specified file or files, move the cursor to this item and press **Enter**. A small box appears to the right of the menu with these options:



To turn the read-only attribute on, move the cursor to Set. To turn the attribute off, move the cursor to Cancel. Select No Change if you don't want to change anything. Press **Enter**.

Include All Subdirectory Files—If you want to include all files in any subdirectories of the specified filename, select YES.

When you have made your selections, move the cursor block down to START ATTRIB and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The program changes the attributes as specified, or if no change is selected for attributes it displays the current attributes. The screen then prompts you to press any key to continue, and the Change File Attributes menu reappears. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Copy Files/Directories

Use the Copy Files/Directories option to copy files and directories. This is a useful way to copy groups of files within their directories, which you cannot do with the COPY command.

This option runs the MS-DOS XCOPY program.

When you select the Copy Files/Directories option, the screen displays this menu:

```
                    EXIT
  Source =
  Target =
   NO      Copy Only Modified Files
   NO      Duplicate Empty Subdirectories
   NO      Copy Files and Turn Off Archive Attribute
   NO      Prompt Before Copying Each File
   NO      Include Files In All Subdirectories
   NO      Check the Copy Against the Original
   NO      Pause Before Starting
   NO      Copy Files After a Date
**************** S T A R T    X C O P Y **************
```

You must enter the exact file information for the first two items in this menu. The rest of the options offer a choice between NO or YES; you can either accept the default (NO) or press **Enter** to change the parameter to YES. Use the Copy Files/Directories options as follows:

Source—Type the drive letter, pathname, and filename of the file or files on the source disk you want to copy to the target disk. You can use wildcards to identify a group of files. For example, to copy all the files from drive C in the \SALES directory you would type:

```
C:\SALES\*.*
```

Target—Type the drive letter, pathname, and filename where you want to store the copies. For example, to copy the files to the \SALES directory on drive B, you would type:

```
B:\SALES
```

Copy Only Modified Files—If you want to copy only those files that have been modified, select YES. This option copies files whose archive bit has been set, but does not turn off the archive bit of the source file.

Duplicate Empty Subdirectories—If you want to copy empty subdirectories (those that do not contain any files) in addition to those that contain files, select YES. You must also select the Include Files In All Subdirectories option when you select this option.

Copy Files and Turn Off Archive Attribute—Like the Copy Only Modified Files option, this option copies only those files that have been modified, but it also turns off the archive bit on the source files. If you want the archive bit on the source files turned off after the files have been copied, select YES.

Prompt Before Copying Each File—If you want the program to prompt you to respond Yes or No before it copies (or does not copy) each file, select YES.

Include Files In All Subdirectories—If you want the program to copy files in all subdirectories of the specified source directory (in addition to the files in the source directory), select YES.

Check the Copy Against the Original—If you want the program to check the copy against the source file after it copies each file, select YES. If anything is wrong, the program copies the file again.

Pause Before Starting—If you want the program to pause before starting the copy operation so you can swap diskettes if necessary, select YES.

Copy Files After a Date—If you want to copy only those files that were modified on or after a certain date, select YES. A small box appears to the right of the menu with this prompt (for the United States):

```
MM-DD-YYYY
```

Enter the date in this format—two digits each for the month and day and four digits for the year. (The format depends on the COUNTRY command in your CONFIG.SYS file.) You do not enter the dashes. For example, for May 28, 1988 you would type:

```
05281988
```

Then press **Enter** to move the cursor back to the large menu. If you type an invalid date (more than 12 for the month or 31 for the day), you must reenter the date.

When you have made your selections, move the cursor block down to START XCOPY and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The program copies the files as specified. The screen then prompts you to press any key to continue, and the Copy Files/Directories menu reappears. Move the cursor block up to EXIT and press **Enter** to return to the File Utilities menu.

Disk Utilities

When you select the Disk Utilities option from the main menu, the screen displays these options:

```
   EXIT
Check Disk
Disk  Copy
Disk
Compare
Format Disk
```

Move the cursor block to the option you want and press **Enter**. Then follow the appropriate instructions below for that option.

The Disk Utilities option calls the Epson program DU. When you select one of the options from this menu, DU runs the corresponding MS-DOS command.

Check Disk

Use the Check Disk option to check the directories, files, and file allocation tables on the specified disk. The program displays a disk and memory status report. This option runs the MS-DOS CHKDSK program.

When you select the Check Disk option, the screen displays this menu:

```
Destination = A:
    NO          Correct Errors
    NO          Display Messages
  ******** START CHECK DISK ********
```

Use the Check Disk options as follows:

Destination Drive—Enter the letter of the drive containing the disk you want to check. The default is A. If you want to check a particular file or group of files to see if they are contiguous, you can specify a filename as well. For example, to check all files in drive A with the extension .TXT, you would type:

```
A:*.TXT
```

Correct Errors—If you want the program to recover unoccupied space left by file fragments, select YES.

Display messages—If you want the program to display filenames and directories while it is running, select YES.

When you have made your selections, move the cursor block down to START CHECK DISK and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

The program checks the disk and files as specified. The screen then prompts you to press any key to continue, and the Check Disk menu reappears. Press ↑ to return to the Disk Utilities menu.

Disk Copy

Use the Disk Copy option to make an exact copy of a diskette. This option runs the MS-DOS DISKCOPY program. It is a good idea to write protect your source disk before copying it so you do not accidentally destroy any of its data. (See your User's Guide for instructions.)

When you select the Disk Copy option, the screen displays this menu:

```
    :       Source Drive
    :       Destination Drive
   NO       Copy a Single Side
******** START DISK COPY ********
```

Use the Disk Copy options as follows:

Source Drive—Enter the letter of the drive containing the source disk (the disk you want to copy).

Destination Drive—Enter the letter of the drive containing the target disk. (If you have only one diskette drive, enter that letter for both the source and destination drives.)

Copy a Single Side—If you are copying to a single-sided diskette, select YES.

When you have made your selections, move the cursor block down to START DISK COPY and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts carefully to insert and swap diskettes as necessary. Be careful not to mix up the source and target diskettes. When the diskette has been copied, this prompt appears:

```
Copy another diskette (Y/N)?
```

If you want to copy another diskette, press **Y** and **Enter** and then follow the screen prompts. If not, press **N** and **Enter**. The Disk Copy menu reappears. Press ↑ to return to the Disk Utilities menu.

Disk Compare

Use the Disk Compare option to compare the contents of one diskette with another. This option runs the MS-DOS DISKCOMP program.

When you select the Disk Compare option, the screen displays this menu:

```
  :       Source Drive
  :       Destination Drive
DOUBLE    Single/Dbl Sided
 9        8/9 Sectors/Trk
*** START DISK COMPARE ***
```

Use the Disk Compare options as follows:

Source Drive—Enter the letter of the drive containing the first of the two diskettes you want to compare.

Destination Drive—Enter the letter of the drive containing the second diskette. (If you have only one diskette drive, enter that drive letter for both the source and destination drives.)

Single/Dbl Sided—If you are comparing two 5¼-inch single-sided diskettes, select SINGLE.

8/9 Sectors/Track—If you are comparing 5¼-inch diskettes that were originally formatted with eight sectors per track, select 8.

When you have made your selections, move the cursor block down to START DISK COMPARE and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts to insert and swap diskettes as necessary. When the diskettes have been compared, this prompt appears:

```
Compare another diskette (Y/N)?
```

If you want to compare more diskettes, press **Y** and **Enter** and then follow the screen prompts. If not, press **N** and **Enter**. The Disk Compare menu reappears. Press ↑ to return to the Disk Utilities menu.

Format Disk

Use the Format Disk option to format a diskette or the hard disk so MS-DOS can write to it and read it. The diskette can be a new, blank diskette, or one that contains data you do not want to keep. For a hard disk you may want to use the SELECT command instead because it automatically installs MS-DOS (with the country information) on the disk.

This option runs the MS-DOS FORMAT program.

Warning
The FORMAT program erases all data on the diskette. Be sure you do not want to keep any files on a used diskette before you reformat it.

When you select the Format Disk option, you see this prompt:

```
Destination Drive
```

Enter the letter of the drive containing the diskette you want to format. When you press **Enter** or ↓, the screen displays a menu such as this:

```
   A:     Destination Drive
DOUBLE    Single/Double Sided
   NO     8 Sectors / Track
   NO     Create System Disk
   NO     Create Volume Label
   NO     Create MS-DOS Area
1.2MB     Media in 1.2MB Drive
   NO     Sectors / Track
   NO     Tracks
***** START DISK FORMAT *****
```

This menu shows all possible options; if your system configuration is different, you may not see all of these.

Use the Format Disk options as follows:

Single/Double Sided—If you are formatting a 5¼-inch single-sided diskette, select SINGLE.

8 Sectors/Track—If you want to format a 5¼-inch diskette with eight sectors per track, select YES.

Create System Disk—If you want to copy the MS-DOS system files to the diskette so it will be bootable, select YES.

Create Volume Label—If you want the disk to have a volume label, select YES. The program prompts you for the name when it is running.

Create MS-DOS Area—This option reserves space on an 8-sectored 5¼-inch diskette for the MS-DOS system files without creating a system disk. If you select this option (YES), you can later copy any version of MS-DOS to the disk with the SYS command; without the option, you can place only version 3.3 of MS-DOS on the disk.

Media in 1.2MB Drive—If you want to format a 360KB diskette in a 1.2MB drive, select 360KB.

Sectors/Track—If you want a 1.2MB or 1.44MB diskette to be formatted to use less than the maximum capacity allowed by a disk drive, select YES. A small box appears to the right of the menu. Enter the number of sectors per track you want the diskette to be formatted with and press **Enter**. For a 1.2MB diskette, *nn* is equal to 15, 9, or 8. For a 1.44MB diskette, *nn* is equal to 18 or 9.

Tracks—If you want a 1.2MB or a 1.44MB diskette to be formatted to use less than the maximum capacity allowed by a disk drive, select YES. A small box appears to the right of the menu. Enter the number of tracks you want the diskette to be formatted with and press **Enter**. For a 1.2MB diskette, you can enter 40 or 80. For a 1.44MB diskette, you can enter only 80.

When you have made your selections, move the cursor block down to START DISK FORMAT and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts to insert the diskette or enter a volume label, as necessary. When the disk has been formatted, this prompt appears:

```
Format another (Y/N)?
```

If you want to format another diskette, press **Y** and **Enter** and then follow the screen prompts. If not, press **N** and **Enter**. When the Format Disk menu reappears, press ↑ to return to the Disk Utilities menu.

Mode Settings

When you select the Mode Settings option from the main menu, the screen displays these options:

```
    EXIT
Video Display
   Printer
 Serial Port
Redirect LPTn
  Code Page
```

These options let you define the operation of your printer, monitor or serial port, and control code page switching.

Move the cursor block to the option you want and press **Enter**. Then follow the appropriate instructions below for that option.

The Mode Settings option runs the MS-DOS MODE command. Any changes you make remain in effect until you change them, or turn off or reset the computer.

Video Display

Use the Video Display option to change the way your screen displays text. When you select this option, the following menu appears:

```
  BW80    Attributes
  None    Alignment
  No      Test Pattern
*** START VIDEO SETUP ****
```

Table 5-2 shows the default and alternative values you can select for these parameters.

Table 5-2. Video display parameters

Option	Default	Alternative
Attributes (black & white or color, 40 or 80 columns of screen image width)	BW80	40 80 BW40 CO40 CO80 MONO
Alignment (column shift to offset screen image on monitor)	None	Right Left
Test Pattern (display number pattern to see if screen image is centered)	No	Yes

When you have made your selections, move the cursor block down to START VIDEO SETUP and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts until the Video Display menu reappears. Move the cursor block back up to return to the Mode Settings menu.

Printer

Use the Printer option to select the printer device and to change the way it prints. When you select the Printer option, this menu appears:

```
  LPT1    Printer #
  132     Chars Per Line
  6       Lines Per Inch
  No      Retry on errors
** START PRINTER SETUP ***
```

Table 5-3 shows the default and alternative values you can select for these parameters.

Table 5-3. Printer parameters

Option	Default	Alternative
Printer # (printer device number)	LPT1	LPT2 LPT3
Chars Per Line (number of characters to print)	132	80
Lines Per Inch (number of lines to print per vertical inch)	6	8
Retry on errors (entry print when errors occur)	No	Yes

Note: You can use only printer device LPT1 unless you install additional option cards for multiple printer ports.

When you have made your selections, move the cursor block down to START PRINTER SETUP and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again. Follow the screen prompts until the Printer menu reappears. Then move the cursor block back up to return to the Mode Settings menu.

Serial Port

Use the Serial Port option to select the serial port you want to use and to define the communication parameters. When you select the Serial Port option, this menu appears:

```
   COM1  Port Number
   9600  Baud Rate
   None  Parity
   8     Data Length
   1     # of Stop Bits
   No    Retry on errors
* START SERIAL PORT SETUP *
```

Table 5-4 shows the default and alternative values you can select for these parameters.

Table 5-4. Serial port parameters

Option	Default	Alternative
Port Number (communications port number)	COM1	COM2 COM3 COM4
Baud Rate (bits transmitted per second)	9600	110 150 300 600 1200 2400 4800 19200
Parity (checking method for bits transmitted)	NONE	ODD EVEN
Data Length (number of bits in each character transmitted)	8	7
# of Stop Bits (number of bits used to flag transmitted characters)	1	2
Retry on errors (retry when errors occur)	No	Yes

Note: You can use only communication port COM1 unless you install additional option cards for multiple serial ports.

When you have made your selections, move the cursor block down to START SERIAL PORT SETUP and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts until the Serial Port menu reappears. Then move the cursor block back up to return to the Mode Settings menu.

Redirect LPTn

Use the Redirect LPTn option to redirect data from the printer port to the serial port. When you select this option, the following menu appears:

```
   LPT1   Printer #
   COM1   Port Number
* START PRINT REDIRECTION *
```

Table 5-5 shows the default and alternative values you can select for these parameters.

Table 5-5. Redirect LPTn parameters

Option	Default	Alternative
Printer # (printer device number to receive output)	LPT1	LPT2 LPT3
Port Number (communications port directing printer output)	COM1	COM2 COM3 COM4

Note: You can use only COM1 unless you install special option cards with additional hardware input/output ports.

When you have made your selections, move the cursor block down to START PRINT REDIRECTION and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts until the Redirect LPTn menu reappears. Then move the cursor block back up to return to the Mode Settings menu.

Code Page

MS-DOS lets you choose from five different code pages (international character sets) so you can produce characters not available in the default character set.

Note
Be sure to read Chapter 9 for information on code page switching before you use the Code Page option.

Use the Code Page option to do the following:

- Prepare one or more code pages to be selected for use by your monitor or printer.
- Select (activate) which code page to use with which device.
- Display the current status of code page selections for a particular device.
- Refresh (reselect) a code page that was deactivated because of an error, such as a printer malfunction.

When you select the Code Page option, this menu appears:

```
Prepare
Select
Status
Refresh
```

Move the cursor block to the option you want and press Enter. Then follow the appropriate instructions below for that option.

Prepare—Before you can prepare a code page, you must have used the DEVICE command in the CONFIG.SYS file to activate the device driver(s) you want to be able to use code page switching. (See Chapter 6 for instructions.)

When you select the Prepare option, this menu appears:

```
  CON        Device
             Code Page List
 EGA.CPI     File Name
** START PREPARE SETUP **
```

Table 5-6 shows the default and alternative values you can select for these parameters.

Table 5-6. Prepare code page parameters

Option	Default	Alternative
Device	CON	PRN LPT1 LPT2 LPT3
Code Page List	None	437 850 860 863 865
File Name (code page information file)	EGA.CPI	4201.CPI

When you have made your selections, move the cursor block down to START PREPARE SETUP and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts until the Prepare menu reappears. Press ↑ to return to the Code Page menu.

Select—Once you have prepared a code page, you use the Select option to activate the code page for a particular device. When you choose the Select option, this menu appears:

```
  CON      Device
  850      Code Page List
** START SELECT SETUP ***
```

Table 5-7 shows the default and alternative values you can select for these parameters.

Table 5-7. Select code page parameters

Option	Default	Alternative
Device	CON	PRN LPT1 LPT2 LPT3
Code Page List	None	437 850 860 863 865

You can select only one code page per device.

When you have made your selections, move the cursor block down to START SELECT SETUP and press **Enter** to begin. If you have entered any invalid information in the menu, an error message appears stating what is wrong. Correct the error and select the START option again.

Follow the screen prompts until the Select menu reappears. Press ↑to return to the Code Page menu.

Status—Use the Status option to display the code page status for a particular device. When you choose the Status option, this menu appears:

```
    CON        Device
*** CODE PAGE STATUS ****
```

Press **Enter** to display the device list:

```
CON
PRN
LPT1
LPT2
LPT3
```

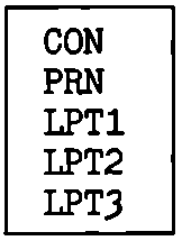
Choose the device for which you want to display the code page status. Then move the cursor block down to CODE PAGE STATUS and press **Enter** to begin. If you have selected an invalid device, an error message appears. Correct the error and try again.

The program displays the number of the active code page currently selected and any other prepared code pages for the device. Press any key to return to the Status menu. Press ↑ to return to the Code Page menu.

Refresh—Use the Refresh option to reselect a code page that has been deactivated because of an error. When you choose the Refresh option, this menu appears:

```
    CON      Device
*** REFRESH CODE PAGE ***
```

Press **Enter** to display the device list:



Choose the device for which you want to refresh the code page. Then move the cursor block down to REFRESH CODE PAGE and press **Enter** to begin. If you have selected an invalid device, an error message appears. Correct the error and try again.

The program refreshes the code page previously selected for the device. Press any key to return to the Refresh menu. Press ↑ to return to the Code Page menu.

HELP

You can use the HELP option to display onscreen instructions for any MS-DOS command or Epson utility. HELP provides a quick way to learn about a new command or to quickly check something about a familiar command.

The two programs that provide HELP information, HELP.COM and HELP.TXT, must be in the same directory. Also, if you are not logged onto the directory containing these files, you must have previously used the PATH command to set a path for these files.

When you select the HELP option, a directory listing of all the commands appears on the screen.

You see this prompt at the bottom of the screen:

```
↑↓→←Select command name,
Enter to display command, Esc to Exit
```

Use the cursor keys to select a command name. (You can select only one command name at a time from the menu.) When the correct command is highlighted, press **Enter**. The help screen for the specified command appears.

If there is more than one page of text, you see the prompt PgUp on the top of the screen. Press **Page Up** to display the rest of the text. After reading the help information, press **Esc** to return to the menu.

Enter DOS Command

Use the Enter DOS Command option to run any MS-DOS command from the MENU program. This is useful if you want to run a command that is not included in the list of MENU options, but you don't want to leave the MENU program.

To use an MS-DOS command through MENU, COMMAND.COM must either be in the current directory or must be part of the path specified in the PATH command.

When you select this option, a command line appears for you to type the MS-DOS command. The screen also shows the drive you are currently logged onto, for example:

```
Current Drive: C
```

Enter the command you want to run, including the complete pathname if necessary, and press **Enter** to execute it. For example, to display a directory of the files on drive A, you would type the following and press **Enter**:

```
DIR A:
```

The screen displays a list of all the files on drive A.

After the command has been completed, the screen displays this prompt:

```
Press any key
```

Press a key to return to the command line. When you finish using this option, press ↑ to return to the main menu.

SETPRINT

The SETPRINT program lets you choose a variety of options for your Epson-compatible printer. By selecting from the menu, you can change such items as typeface and skip over perforation.

To run the program, log onto the directory containing the SETPRINT program or enter the correct pathname, and then type SETPRINT and press **Enter**. The screen displays this main menu:

```
      Exit Program
      Initialize Printer
      Send Form Feed
      Send Carriage Return
off   CONDENSED Mode
off   EXPANDED  Mode
off   EMPHASIZEDMode
off   ITALICS   Type Face
off   ELITE     Type Face
off   Skip-Over-Perf
off   Double-Strike
off   Unidirectional Printing
off   Proportional Spacing
      PRINT this message as a test.
```

Each of the menu options acts as a switch for controlling your printer. Use ↓ or ↑ to move the cursor block to an option. Press **Enter** to activate the function or to select the alternate function.

Be sure to turn on and properly connect your printer before beginning.

When you have made your selection, move the cursor block up to Exit Program and press **Enter**. Your printer now prints according to your choices until you change them or turn off or initialize the printer.

Remember two important points about SETPRINT:

- SETPRINT is designed to control the printing of an entire document or file. If you want to use a particular typestyle for only part of a document, use the print control feature of your application program.
- Some application programs, especially word processors, may cancel your SETPRINT settings.

Options

The menu options make it very easy to select the way your printer operates:

Exit Program—This is your cursor's default position when you first run SETPRINT. Select this option to exit the program and return to the MS-DOS command prompt.

Initialize Printer—Select this option to send a hardware reset that clears any commands you may have set and restores all default settings.

Send Form Feed—Select this option to send a form feed code that advances your paper to the next top of form, which is usually the top of the next page. This command is handy for ejecting single sheets when you finish printing.

Send Carriage Return—Select this option to advance the paper in your printer one line. This is convenient any time you want to move the paper up just a few lines. (This option sends a carriage return and a line feed.)

CONDENSED Mode—Select this option to turn on (or turn off) condensed mode. With condensed mode printing, 132 characters appear on each line, instead of the usual 80.

EXPANDED Mode—Select this option to turn on (or turn off) expanded mode. Expanded mode printing creates double-wide characters useful for emphasis and headings.

EMPHASIZED Mode—Select this option to turn on (or turn off) emphasized mode. Emphasized mode printing uses twice as many dots for each character, slightly offsetting them to fill in and make the image darker.

ITALICS Type Face—Select this option to turn on (or turn off) italic character printing.

ELITE Type Face—Select this option to turn on (or turn off) elite character printing. Elite characters print 12 to the inch instead of 10.

Skip-Over-Perf—Select this option to enable or disable automatic skip over paper perforations while printing. When this option is on, your printer leaves margins at the top and bottom of each page of continuous-form paper. Do not use this feature if your application program provides top and bottom margins.

Double-Strike—Select this option to turn on (or turn off) double-strike printing. Double-strike printing makes two passes on each line, giving a darker image.

Unidirectional Printing—Select this option to enable (or disable) unidirectional printing. Ordinarily, your printer prints in both directions (bi-directional) to save time. When you want a more precise vertical line, such as you might use to rule a table, unidirectional printing provides greater accuracy.

Proportional Spacing—Select this option to enable (or disable) proportional spacing. The width of proportional characters varies from character to character. Therefore, a narrow letter like i receives less space than a wide letter like W.

PRINT this message as a test—When you have made the selections you want from the above list, you can test the appearance of their output by using this option to print a sample line. Press **Enter** to print the sample line using the options you have selected.

Cautions

While you can't damage your printer or stored data through a misuse of SETPRINT, there are things you need to be aware of so the operation goes smoothly.

Always be sure that your printer is on and on line before using SETPRINT. Your setup codes do not affect the printer unless it is connected and ready.

The SETPRINT codes are mainly for Epson-compatible dot-matrix printers. The typeface and print mode options apply only to dot-matrix printing; naturally, a daisy wheel cannot compress or expand its characters. However, a daisy wheel printer can print unidirectionally, perform double-strike, and skip over perforations, if it uses Epson-compatible codes.

Some application programs automatically send reset codes to the printer, which could clear any settings you make with SETPRINT. Read the documentation for your application program to see if its codes interfere with SETPRINT's printer configurations and if you can disable its reset code. If not, you can probably choose the same options through your application program.

Once you select the configuration for your printer and exit SETPRINT, the new configuration does not appear on the SETPRINT menu. It isn't possible to read the status of the printer and display it. Anytime you are unsure of how your printer is set up, you can print the test message to verify it, or use the Initialize Printer option and reconfigure.

SETPRINT always directs its codes to the parallel port of your computer. If you are using a serial printer connected to the serial port, your printer does not receive SETPRINT's codes unless you have redirected LPT to the COM port. In this case, the Initialize Printer option does not work. (See the description of the Mode Settings option of the MENU command earlier in this chapter.)

XTREE

XTREE does the work of nine MS-DOS internal commands—and it provides several other features not available elsewhere in MS-DOS. The MS-DOS command functions that XTREE puts into a convenient menu format are shown in Table 5-8.

Table 5-8. XTREE command features

MS-DOS commands	XTREE command features
DIR	Displays all the directories as well as the files they contain and the file statistics
DEL	Deletes files individually or in groups, by file specification and by tagging
COPY	Copies files individually or in groups, to any directory on any disk
TYPE	Displays the content of any text file
RENAME	Renames files individually or in groups, by using wildcards
MKDIR	Makes new directories within your present directories
RMDIR	Removes empty directories
CHDIR	Changes from one directory to another instantly
VOL	Displays the volume label of your disk

XTREE also offers special functions that allow you to:

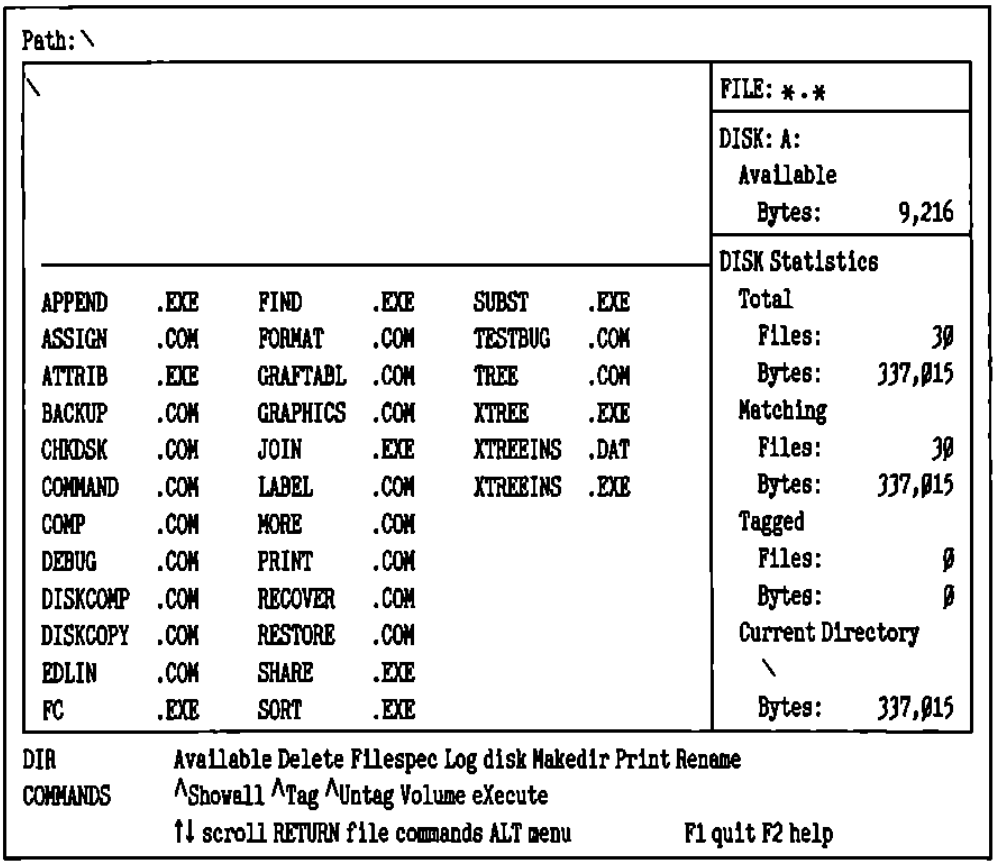
- Create or change volume labels at any time, without reformatting
- Display every file on a disk, regardless of its directory
- Display the complete directory structure of a disk in a single graphic representation
- Move a file, or files, from one directory to another on the current disk
- Assign new names to files as they are copied
- Print the contents of a file on the printer

- Rename a directory at any time, whether or not it contains files
- Display and change the attributes of any file; attributes are special switches that you use to designate files as read-only, hidden, system, or archived
- Display data in either ASCII or hexadecimal format
- Execute programs
- Display how much space is available on your disks
- Modify screen parameters.

Caution
Remember that XTREE is very powerful. You can erase a group of files by merely pressing a couple of keys. If you begin an operation and then change your mind, press **F3** to cancel it.

Using the menu

To run the program, log onto the directory containing the XTREE program or enter the correct pathname, and then type XTREE and press **Enter**. The screen displays a menu similar to this:



Note

If your monitor seems to flicker or shows interference (snow) in the background when you are using XTREE, you may want to run the program XTREEINS to improve the display. See the XTREEINS command in this chapter.

This screen shows you directories and files at a glance, displays the vital statistics of a disk, and identifies the command and control keys available. Taking the screen a section at a time, here's what it contains:

- Top line—The path shown here is your current path location in a disk's directory structure. If only a backslash (\) symbol displays, you are in the root directory.
- FILE box—This is the key to displaying files. Only files that match the specification shown here can appear on the screen; all others are invisible. The wildcard characters (*.*) you first see in this box allow all files to match, so they are all displayed.
- DISK box—This box identifies the disk you're looking at, its label, and the amount of space available. XTREE updates this information every time you log onto a new drive or make a change on a disk.
- DISK/DIRECTORY Statistics box—This box summarizes your disk's vital statistics. When you position the cursor on a directory name, this box displays information about the whole disk (DISK Statistics) plus the name of the directory. When you place the cursor on a file, this box displays information about the directory containing the file (DIRECTORY Statistics) plus the name of the file. XTREE updates this information each time you make a change.

  This box contains these subheadings:

  —Total. The total files and bytes present on a disk or in a directory.

  —Matching. The number of files and bytes on a disk or in a directory that match the specification given in the FILE box.

  —Tagged. The number of files and bytes on a disk or in a directory that you tag with a diamond symbol. Tagging marks the files you want a command to affect.

- Directory window—The large box at the upper left shows the directory structure of your disk. If your disk has no subdirectories only the root directory symbol (\ ) appears. The names of all directories branching from the root are displayed underneath the root, with subdirectories indented to the right. To find a particular directory or file, begin by moving the cursor through the names on this display.

  As many as 10 directories may appear in this window at one time. If there are more, you can scroll the cursor up or down to see them.

- Files window—The large box at the lower left shows the files of individual directories. The current directory is the one the cursor position indicates on the directory window above. Press **Enter** to move the cursor into the files window in order to work with individual files. Press **Enter** again to expand the file window and display more files. Press **Enter** one more time to restore the cursor to the directory window.

  This window expands or contracts, depending on the number of files in a directory. When the directory window is present above, it shows up to 36 files; when the display expands, it can show as many as 57 files. If there are more files, scroll the cursor to the upper left or lower right to view them.

- DIR/FILE COMMANDS line—Just below the windows are two lines that identify the XTREE command keys. The highlighted initials of these commands represent the keys you press to use XTREE's many functions. The single-key commands apply to individual files or directories, while the control-key combinations (such as **Ctrl A**) affect all tagged files.

  Two sets of commands are available. The commands that apply to directories (DIR COMMANDS) are visible when the cursor is in the directory window, and the commands that apply to files (FILE COMMANDS) are visible when the cursor is in the files window.

For both DIR COMMANDS and FILE COMMANDS, press the **Alt** key to see the Alt commands that are available. You invoke the Alt command by holding down the **Alt** key and pressing one of the specified letters. The Alt commands are either seldom used commands or an alternate form of an existing command.

- Prompt line—This helpful reminder is constantly present at the lower left corner of the screen. Regardless of which XTREE function you're using, this line identifies the keys that control the screen display and the commands you need to complete the function.
- Function key line—This line at the lower right corner of the screen shows the function key commands available to you.

Using this collection of displays and commands is very easy. Follow the directions on the prompt line to move the cursor through the directory and file displays, or try the S command to show all your disk's files on screen at once. Press **L** to log onto other drives—and watch XTREE gather a disk's statistics into a display showing its directory structure and files.

Options

You can perform numerous directory and file functions with XTREE. Before you begin any work with XTREE, always make sure that you log onto the correct drive to work on its directories or files.

Look at the drive letter and disk label that appear in the DISK box of the menu screen. To log onto a different drive, press **L**, and then press the letter of the appropriate drive.

Remember that the specification shown in the FILE box determines which files appear. You can work on only the files you can see, and you can see only the files that match the specification. When you need to limit the files shown, press **F** and type the new specification; then press **Enter**.

XTREE options fall into four groups:

- Cursor controls—to select directories and files
- Key commands—to act on directories and files
- Function key choices—to control XTREE itself
- Alt key functions—to act on directories and files.

The cursor controls ← → ↑ ↓ are shown on the prompt line at the lower left of the screen. These keys move through the displays of directories and files. You can also press **Enter** to toggle through the windows in rotation.

The key commands come in two sets, one for directories (DIR commands) and one for files (FILE commands). These commands actually perform work on your disks. To use them, type the first letter of the command (or **Ctrl** plus the initial). They are automatically executed so you don't need to press **Enter**. When you need to provide further input, a prompt appears at the lower left of the screen.

The function keys are the main switches for XTREE. When you need a helpful reminder, or when you need to start or stop execution of a command, these keys act instantly to control the program.

The Alt key functions can be performed for the DIR commands or FILE commands. Press **Alt** to see the available functions. To execute an Alt command, hold down the **Alt** key and press the first letter of the command. When you need to provide further input, you see a prompt on the lower left side of the screen.

DIR commands

Table 5-9 describes the key commands that you see when the cursor is in the directory window. A complete description of each command and how it works follows the table.

Table 5-9 XTREE DIR commands

Command name	Access key	Description
Available	A	Shows available bytes
Delete	D	Deletes empty directory other than root directory
Execute	X Alt X	Executes an internal command or external utility without leaving XTREE
File display	Alt F	Changes the file display
Filespec	F	Sets a new file specification in FILE box
Log disk	L	Logs onto another disk
Makedir	M	Makes a new directory branching from current directory
Print	P	Prints directory information on the printer
Rename	R	Renames any directory except root directory
Show all files	S Ctrl S	Shows disk's files on screen regardless of directory Shows all matching files that are tagged
Sort files	Alt S	Changes the order in which files are displayed
Tag	T Ctrl T Alt T	Tags all files in the selected directory Tags all files that match file specification Tags all files that match attribute settings
Untag	U Ctrl U Alt T	Untags all files in the directory Untags all files that match specification Untags all files that match attribute settings
Volume	V	Creates or changes a volume label on current disk

Available

Press **A** to see the number of bytes available on another disk. The screen displays the following:

```
AVAILABLE SPACE on disk:
```

Press the letter representing the drive that contains the disk you want to check. The screen displays:

```
nnn,nnn Bytes
press ANY KEY to continue
```

When you press a key, the prompt disappears and the directory window reappears.

Delete

Press **D** to delete any empty directory other than the root directory. To select a directory, place the cursor on it. When you press **D**, the screen displays these prompts:

```
DELETE sub-directory: name
delete this directory (Y/N) ?
```

Press **Y** to delete or **N** to cancel the deletion. The directory window reappears.

Execute

Press **X** to execute a different external command while you remain in XTREE. XTREE logs onto your currently displayed directory and displays the command line:

```
Current Path: A:\
)
```

Type the name of the command or program you want to run and press **Enter**. For example, you can type FORMAT or CHKDSK to format or check a disk. After the command or program executes, the command line reappears. Press **Enter** to return to the XTREE menu.

Warning
Do not execute memory resident programs from XTREE. If you do, XTREE does not reload after the program runs; instead, MS-DOS exits XTREE and the A› prompt reappears. This type of exit can cause problems in your computer's memory. Run memory resident programs only at the MS-DOS system prompt.

Files

Press **F** to set a new file specification in the FILE box (remember, only the files that match the specification appear on your screen or can be affected by a command). When you press **F**, the screen displays these prompts:

```
FILES specification:
enter a file spec or press RETURN for *.*
```

Type the new specification and press **Enter**, or press **Enter** alone to accept the wildcards. After you enter the specification, it appears in the FILE box and the commands reappear. The files that match the new specification appear on your screen.

Log disk

Press **L** to log onto a different disk. You must log onto a disk through XTREE before you can work on its files. When you press **L**, the screen displays these prompts:

```
LOG DISK:
enter new default drive
```

Press the letter of the drive you want. XTREE logs the drive you specify, reads the directory of that disk, and presents its file structure.

Makedir

Use this command to make a new directory. Before you press **M**, however, position the cursor on the directory from which the new directory should branch. If the root directory is the current directory, it is identified by a backslash (\). When you press **M**, the screen displays the following:

```
MAKE sub-directory under: \directory
                            as:
 enter new directory name
```

Type the name of the new directory and press **Enter**. The new name adds to the file structure display and the commands reappear.

Print

Press **P** to print directory information on your printer. XTREE asks you to select the type of directory data to be printed. Select one of the following choices by keying the appropriate letter:

—Catalog of tagged files. Select this option to print the names and statistics of all files that have been tagged on the disk. The printout contains a heading for each directory on the disk that has at least one tagged file, followed by the list of tagged files in that directory.

—Pathnames. Select this option to print a list of all the path names on the disk. Each path name is listed on a line by itself, and the names are printed in the order you see them in the Directory Window.

—Tree. Selecting this option gives you a printout of the directory tree structure as you see it in the directory window.

For print functions, XTREE prints a heading at the top of each page. The heading contains the name of the disk, time and date of the printout, and the page number of the printout. XTREE assumes that each print page is 66 lines long, which is standard for an 11-inch form.

You can cancel the print operation by pressing the **F3** key.

Rename

Use this command to rename any directory except the root directory. Place the cursor on the directory you want to rename and press **R**. The screen displays the following:

```
RENAME sub-directory: present name
                   to:
enter new directory name
```

Type the directory's new name, using up to eight characters, and press **Enter**. XTREE displays the new name and the commands reappear.

Show all files

Press **S** to show all your disk's files on the screen. This command displays every file, regardless of its directory. The files list alphabetically, and you can read their path locations on the path line at the top of the screen. You can view any files that don't fit on the screen by scrolling the cursor to the upper left or lower right of the window.

While showing all files, you are able to affect them by running other XTREE commands. Press **Enter** to restore the display when you're done.

Tag

Press **T** to tag all files in a directory. To select a directory, just move the cursor to its name and press **T**. A diamond symbol appears beside all the files in the directory. Once you tag a file with this symbol, it is subject to other XTREE commands such as copying and deleting. Tagging allows you to define the files you are handling as a group.

Untag

Press **U** to untag all files in the directory. Just move the cursor to the directory and press **U**. This removes all tags in a directory. Untag the files when you complete an operation so you do not accidentally affect them when executing a different operation later. This also saves the work of untagging files individually.

Volume

Press **V** to create or change a volume label on the disk you're using. This allows you to give a disk a new identification label without using the LABEL command. When you press **V**, the screen proınpts:

```
CHANGE DISK VOLUME NAME: current name
                              to:
enter new volume name
```

Type the new name, using up to 11 characters; then press **Enter**. The new name displays in the DISK box and the commands reappear.

Ctrl Show all files

Press **Ctrl S** to display all matching files that are tagged. All subsequent operations affect the display the same as the Show all files command.

Ctrl Tag

Press **Ctrl T** to tag every file on your disk that matches the file specification, regardless of its directory. The cursor can be on any directory name. Diamond symbols appear next to all files, making them subject to other XTREE commands, such as copying or deleting.

Ctrl Untag

Press **Ctrl U** to untag every file on your disk that matches the file specification, regardless of its directory. The cursor can be on any directory name. All the diamond symbols disappear, making the files safe from the commands you use later.

Alt eXecute

Press **Alt X** to execute programs and commands from XTREE. This command is identical to the execute command with the following important exception. When you return to XTREE, XTREE logs back onto the current disk without updating the file structure. If you have not added, removed, or changed any files or directories on the logged disk, you will not have any problems. However, if you made any changes to the logged disk, XTREE may have problems. If you see this message:

```
ERROR: Disk has been changed
```

use the Log command to log onto the disk.

Alt file display

Press **Alt F** to change the format of the display in the file window. This command displays the name, extension, size, and MS-DOS attributes of each file, and organizes the list into two columns. All subsequent displays in the file window are in the new format, until you press **Alt F** again. Then they are displayed with the date and time as well. Press **Alt F** again to return to the three-column display.

Alt Sort files

Press **Alt S** to change the order in which files are displayed in the file window. XTREE asks you to select the sort order to use in all subsequent displays in the file window. Select one of the following by pressing the appropriate letter:

—Name. This is the normal sort order. Files are displayed in alphabetical order by their names.

—Extension. XTREE displays the files in alphabetic order by their file name extension. For example, all the *.DOC files appear before the *.TXT files. Files with the same extension are displayed in alphabetic order by name.

—Size. XTREE displays files ordered by their size. The largest files appear first, followed by smaller files. Files with the same size are ordered by name.

Alt Tag

Press **Alt T** to tag all matching files on the disk with certain file attributes set. The attributes of a file are four special bits that you can switch on or off, causing the status of the file to change in certain ways. File attributes are R/O (Read-only), Hid (Hidden), Sys (System), and Arc (Archive):

—R/O (Read-only). When this attribute is on, the filename appears on the directory but you can't erase or write to the file, although you can read it. This protects the file while keeping it visible for reference. +R turns this attribute ON, and –R turns it OFF.

—Hid (Hidden). When this attribute is on, the filename becomes invisible on the directory, although the file is still on your disk. You use this attribute to protect your files. When a file is hidden, you can't erase it using the MS-DOS DEL or ERASE command. XTREE, however, can always see the filename and erase it if necessary. +H turns this attribute ON, and –H turns it OFF.

—Sys (System). When this attribute is on, the file is classified as a system file. This causes it to be hidden from the MS-DOS DIR command and protects it from the DEL or ERASE command. XTREE, however, can always see the file and erase it if necessary. +S turns this attribute ON, and –S turns it OFF.

—Arc (Archive). When this attribute is on, XTREE marks the file. The program interprets this mark to mean that the file was modified since you created it. Programs that are sensitive to modified and unmodified files may check this. XTREE allows you to change the status of this switch. +A turns this attribute ON, and –A turns it OFF.

When you select the Alt Tag command, XTREE prompts you to enter a set of attributes. Type + or – followed by the attribute letter (R, H, S, or A). A + means the attribute must be on for the file to be tagged. A – means the attribute must be off.

You can use any or all of the attributes for each file. For example, type +A–R to tag all files on the disk with the A attribute on and the R attribute off.

Alt Untag

Press **Alt U** to remove the tag from all files that match the attribute setting. Enter the attributes the same way as for Alt Tag.

File commands

Table 5-10 describes the key commands that you see when the cursor is in the files window. A complete description of each command and how it works follows the table.

Table 5-10. XTREE FILE commands

Command name	Access key	Description
Attrib	A Ctrl A	Displays a file's attributes for verification or change; attributes include read-only, hidden, system, and archive Changes attributes of all tagged files
Copy	C Ctrl C Alt C	Copies file at cursor position Copies all tagged files Copies all tagged files, duplicating directories as necessary
Delete	D Ctrl D	Deletes file at cursor position Deletes all tagged files
Execute	X Alt X	Executes external utility without exiting XTREE
File display	Alt F	Changes the format of the display window
Files	F	Sets a new file specification in FILE box
Log	L	Logs onto different disk
Move	M Ctrl M	Moves the current file to another directory Moves all tagged files to another directory
Print	P Ctrl P	Prints the current file on the printer Prints tagged files on the printer

Table 5-10. XTREE FILE commands (continued)

Command name	Access key	Description
Rename	R Ctrl R	Renames file at cursor location Renames all tagged files
Sort files	Alt S	Changes the order in which files are displayed
Tag	T Ctrl T Alt T	Tags file at cursor position Tags all files in a directory Tags all files that match an attribute setting
Untag	U Ctrl U Alt U	Untags file at cursor position Untags all files in directory Untags all files that match an attribute setting
View	V	Views contents of text file at cursor position

Attrib

Press **A** to display the attributes of a file in order to verify or change them. When you press **A**, the screen displays the following:

```
ATTRIBUTES for file: filename mm-dd-yy hh:mm
R/O Hid Sys Arc
                    :
enter attribute changes
```

You see the filename, the date and time the file was created, and the attributes that are switched on. (If an attribute isn't switched on, it doesn't appear.) The four attributes are R/O (Read-only), Hid (Hidden), Sys (System), and Arc (Archive).

Type the attributes and press **Enter**. (The attributes are described under the Alt Tag command.)

For example, type +H+A and press **Enter** to hide and archive a file. (You can set all four attributes at once.) When you set the attributes, they are written to the disk directory. If you only want to see the attributes, not change them, just press **Enter**. The prompt disappears and the commands reappear.

Copy

Press **C** to copy the file at the cursor position. XTREE can duplicate the file in any directory on any drive, and you can rename the file. When you press **C**, the screen prompts you for the name of the new file. Press **Enter** to use the same name or enter a new filename.

```
COPY file: filename as
       to:
enter destination for copy ( [d:] [path] )
```

Type the drive and path destination for the file and press **Enter**. Now copies of the file exist at both the source and destination locations. When copying is complete, the prompt disappears and the commands reappear.

Delete

Press **D** to delete the file at the cursor position. When you press **D**, this prompt appears:

```
DELETE file: filename
delete this file (Y/N) ?
```

Press **Y** to delete the file or **N** to cancel the command. After you select an option, the prompt disappears and the commands reappear.

Execute

Use this command to execute a different external command while you remain in XTREE. Move the cursor to the program you want to run (FORMAT or CHKDSK, for example) and press **X**. The command line displays:

```
Current Path: A: \
)command
```

At this point, you can add parameters to the command line and edit it, if necessary. (The function keys do not work when you are editing the command line.) When you are ready, press **Enter** to execute the command. After the program runs, the command line reappears. Press **Enter** to return to the XTREE menu.

Warning
Do not execute a memory resident program from XTREE. If you do, XTREE does not reload after the program runs; instead, MS-DOS exits XTREE and the A) prompt reappears. This type of exit can cause problems in your computer's memory. Run memory resident programs only at the A) prompt.

Files

Press **F** to set a new file specification in the FILE box. (Remember, only the files that match the specification appear on your screen.) When you press **F**, the screen prompts:

```
FILES specification:
enter a file spec or press Enter for *.*
```

Type the new specification and press **Enter**, or press **Enter** alone to use the wildcards. After you enter the specification, it appears in the FILE box. The files on screen change to match the new specification.

Log

Press **L** to log onto a different disk. You must log onto a disk through XTREE before you can work on its files. When you press **L**, the screen displays the following:

```
LOG DISK:
enter new default drive
```

Press the letter of the drive you want. XTREE reads the directory of the disk in the new drive, and displays its file structure.

Move

Press **M** to move the current file to another directory. This operation is similar to a copy followed by a delete of the original file, except that it is faster. Also, the disk space required to hold two copies of the file is not needed.

XTREE prompts you for a new filename. Press **Enter** to keep the same name. XTREE asks you which directory is to receive the file. You can enter any directory on the logged disk, but you may not enter a drive descriptor. XTREE only moves files to the currently logged disk.

Print

Press **P** to print the contents of the current file on your printer. If the file you wish to print does not contain text information, you may see random and/or nonsense characters appearing on the printout.

XTREE prompts you to ready your printer. Make sure the printer is turned on and that the paper is aligned the way you want. During the printing of the file, you can cancel the operation by pressing **F3**. After printing is complete, XTREE issues a top-of-form command to the printer.

Rename

Press **R** to rename the file at the cursor position. When you press **R**, the screen prompts:

```
RENAME file: filename
          to:
enter new filename
```

Type the new name, using up to eight characters plus an optional three-character extension, and press **Enter**. XTREE writes the new name on your disk.

Tag

Press **T** to tag the file at the cursor position. This places a diamond symbol next to the filename on screen and makes the file subject to other XTREE multiple-file commands such as copying and deleting.

Untag

Press **U** to untag the file at the cursor position. This removes the diamond symbol next to the filename and protects it from other XTREE multiple-file commands such as copying and deleting.

View

Press **V** to view the contents of the text file at the cursor position. Only files containing alphanumeric (ASCII) characters can be displayed properly on the screen. Program files, such as those with .COM or .EXE extensions, cannot be displayed properly unless you use the Hex mode (described below). When you press **V**, the screen displays the first page of the file. The techniques you use to move the cursor through the text and display different parts of the file are:

—↑↓←→. Press ↑ and ↓ to scroll up and down through the text a line at a time. Press ← or → to scroll to the left or to the right two columns at a time.

—Scroll speed. Press a number from 0 through 9 to scroll down through the text continuously. Use the numeric keys 0 through 9 on the top of the keyboard (not the numeric keypad) to select the scroll speed. Press **0** for the fastest, **9** for the slowest speed. You can stop the scrolling by pressing any key (other than a numeric key).

—Goto marker. Press **G** to go to a marker you have previously set in your file with the Set marker option (see description below). A prompt asks you to enter a number from 0 through 9. Type the number of the marker you want to go to (using the numeric keys on the top row of your keyboard). When the marker is found, that line appears at the top of your screen. If you enter a number that you did not previously set as a marker, the top of the document displays on the screen.

—Hex mode. Press **H** to display the file in hexadecimal mode. This is useful for displaying program files or documents created by certain application programs. Press **H** again to return to ASCII mode.

—Set marker. Press **S** to set an invisible marker anywhere within the displayed file. This allows you to later return directly to that marker with the Goto marker option (see description above). A prompt asks you to enter a number from 0 through 9 (use the numeric keys on the top row of your keyboard). When you type the number, it does not appear on the screen and it does not affect the contents of your file.

—Page Up Page Down. Press **Page Up** to display the previous screen page in your file. Press **Page Down** to display the next screen page in the file.

—Home. Press **Home** to move to the beginning of the displayed file.

—End. Press **End** to move to the end of the displayed file.

—Enter. Press **Enter** to quit viewing the file and return to the XTREE menu.

When you are through using View, press **Enter** to return to the XTREE menu.

Ctrl Attrib

Press **Ctrl A** to change the attributes of all tagged files in a directory. These attributes are the same as the A command offers. When you enter this command, the screen displays the following:

```
ATTRIBUTES for all tagged files
                    :
enter attribute changes
```

Type the attribute settings you want to affect on the tagged files and press **Enter**. The cursor moves across the names of the tagged files as the attributes for each change.

Ctrl Copy

Press **Ctrl C** to copy all tagged files in a directory. XTREE duplicates these files in any directory on any drive. When you use this command, the screen displays the following:

```
COPY ALL TAGGED FILES
     to:
enter destination for copy ([d:] [path])
```

Type the drive and path destination for the files and press **Enter**. XTREE asks one more question:

```
automatically replace existing files (Y/N) ?
```

You can either press **Y**, to automatically overwrite files of the same name, or **N** to avoid overwriting.

Now, copies of the files exist at both the source and destination locations. When copying is complete, the prompt disappears and the commands reappear.

This command has an extra feature. If you are mass copying files to a disk that becomes full, XTREE alerts you with this message:

```
Error: Disk Full, press ANY KEY to continue
```

You can replace the full disk with a new one and then press a key to continue (you can reenter the drive and path, if desired). This feature allows you to copy large groups of files, especially from a hard disk, without being limited to a single destination disk.

Ctrl Delete

Press **Ctrl D** to delete all tagged files in a directory. When you use this command, the screen displays the following:

```
DELETE ALL tagged files
confirm delete for each file (Y/N) ?
```

Press **Y** if you want to double-check each file before it is deleted or press **N** to delete every tagged file automatically. When you check each deletion, the screen displays the following:

```
DELETE file: filename
delete this file (Y/N) ?
```

Press **Y** to delete or **N** to skip the file. When the deleting is complete, the prompt disappears and the commands reappear.

Ctrl Move

Press **Ctrl M** to move all tagged files to another directory. The moved files will no longer reside in the current directory.

Ctrl Print

Press **Ctrl P** to print on the printer the contents of all the files currently tagged. If a file does not contain text information, you may see random characters appearing on the printout.

XTREE prompts you to ready your printer. Make sure the printer is turned on and the paper is aligned properly. During printing, you can cancel the operation by pressing **F3**. After printing is complete, XTREE issues a top-of-form command to the printer.

Ctrl Rename

Press **Ctrl R** to rename all tagged files in a directory. This command applies the same set of characters to every file you tag. You can't, of course, give every file in a directory an identical name, but you can give them identical extensions if their names are different, or identical names if their extensions are different. Use wildcards (* and ?) to make substitutions to parts of the filenames. When you use the **Ctrl R** command, the screen displays the following:

```
RENAME ALL tagged files
to:
enter wildcard file specification for rename
```

Type the new name using wildcards for the unaffected part of the filenames, and the specific characters that are to be substituted. Then press **Enter**. For example, to change some text files from the .DOC extension to the .TXT extension, type ***.TXT**. The cursor moves across the names of the files as they change.

Ctrl Tag

Press **Ctrl T** to automatically tag all files in a directory. This saves time when you want to use a multiple-file command such as Copy or Delete, on all the files of a directory. When you press **Ctrl T**, a diamond symbol appears next to the name of each file in the directory.

Ctrl Untag

Press **Ctrl U** to untag all the files in a directory. This removes the diamond symbols next to the filenames, protecting them from other XTREE multiple-file commands such as copying and deleting.

Alt Copy

Press **Alt C** to copy tagged files to another disk, duplicating any directories that do not exist on the destination disk. Use this command to preserve the directory structure of the source files. This is extremely useful for performing backup operation. Alt Copy is similar to Ctrl Copy, with the following exceptions:

- To specify the destination of the copy, enter only a drive letter. The drive must be different from the current drive.
- When XTREE copies a file, it checks to see if the directory that contains the file exists on the destination disk. If it does not exist, XTREE creates the path.
- XTREE copies each tagged file to the destination disk using the source pathname as the destination pathname.

Alt file display

Press **Alt F** to change the format of the display in the file window. This command displays the name, extension, size, and MS-DOS attributes of each file, and organizes the list into two columns. All

subsequent displays in the filé window are in the new format, until you press **Alt F** again. Then they are displayed with the date and time, as well. Press **Alt F** again to return to the three-column display.

Alt Sort files

Press **Alt S** to change the order in which files are displayed in the file window. XTREE asks you to select the sort order to use in all subsequent displays in the file window. This command is the same as Alt Sort files in the ALT DIR commands menu.

Alt Tag

Press **Alt T** to tag all matching files on the disk with certain file attributes set. File attributes are read-only, hidden, system, and archive. This command is the same as Alt Tag in the ALT DIR commands menu, except that only files in the directory are scanned for matching attributes.

Alt Untag

Press **Alt U** to remove the tag from all files that match the attribute setting. Enter the attributes the same way as for Alt Tag. This command is the same as Alt Untag in the ALT DIR commands menu, except only files in the directory are scanned for matching attributes.

Function keys

At the lower right of the screen are the function keys that control XTREE. They work as follows:

F1—Quit

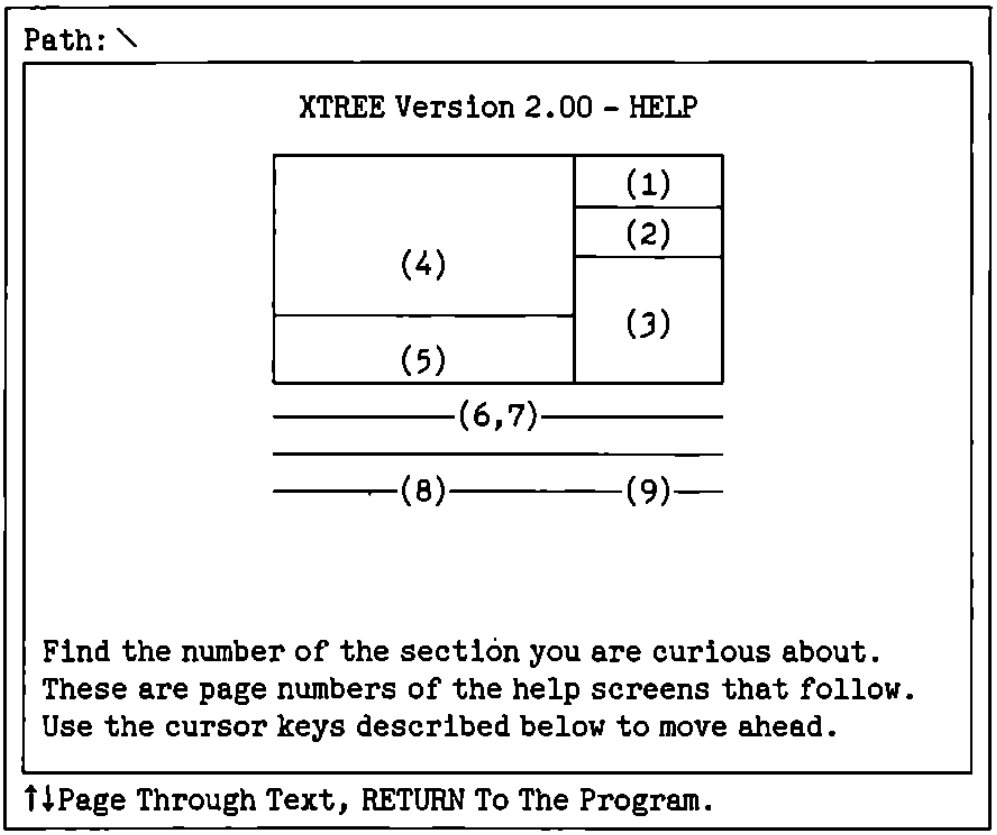
Press **F1** to exit from XTREE at any time. This takes you out of the program and returns you to the MS-DOS command prompt on the default drive. When you press **F1**, the screen displays this prompt:

```
Quit XTREE and return to DOS (Y/N) ?
```

Press **Y** to exit or **N** to return to the XTREE menu.

F2—Help

Press **F2** to display a series of screens that provide quick explanations of XTREE windows, commands, and other helpful information. Each Help screen page represents a section of the XTREE menu display; each page has a number for easy reference. When you press **F2**, the screen displays the following:



From here you can press ↓ to display the HELP pages one at a time or ↑ to go back through them. When you are through reading the Help screens, just press **Enter** to restore the menu. (HELP isn't available during the execution of commands.)

F3—Cancel

Press **F3** to cancel any command in progress. This halts commands and restores the command line to the screen. Sometimes there is a delay before a command can stop. For example, during file copying the command stops after it completes the copy of the current file. When there is no activity to cancel, this key choice does not appear on the screen.

F4—Command display

Press **F4** to toggle the command line display ON or OFF.

Alt F1—Quit

Press **Alt F1** to exit XTREE. This exit returns you to the MS-DOS prompt, but the current directory used by MS-DOS is the same as the last directory you selected while in XTREE.

XTREE offers two other options:

- When you type characters to specify a particular drive and path for copying files, these characters are stored in a buffer. (A buffer is a place in memory that stores information for later use.) Because of this buffer, the characters reappear when you use the copy command a second time. This makes sending files to the same or a similar destination easier the second time. You can clear the buffer by pressing **Esc**.

- As much as possible, XTREE protects against incorrect input. Many keys that would be incorrect for a particular command are locked out of the keyboard automatically. For example, you cannot specify a file such as *.COM using two periods, two asterisks on the same side of the period, or too many characters in the filename. If XTREE is rejecting the characters you type, check to be sure that you are entering them correctly.

There are countless ways you can put XTREE to work. All disk setup and maintenance functions can benefit from this utility. You can add XTREE to batch files like any other MS-DOS command—you could even put it in an AUTOEXEC.BAT file to display a disk's file structure when booting up.

Cautions

With a utility as powerful and as fast as XTREE, you must always be aware of the danger of accidentally erasing important files. For safety, be aware of these things:

- You can cancel commands, even commands in progress, by pressing **F3**. This stops any function.
- It's wise to use **Ctrl A** (the attributes command) to give read-only status to all the files in the directories. Then, in order to erase anything, you must first deliberately remove a file's protection.
- XTREE is limited in the number of files and directories it can handle. XTREE checks to see if a disk has more than 180 directories or 2800 files; if the disk does, XTREE automatically aborts.

XTREEINS

If the monitor you are using does not display clearly when you are in XTREE, you can improve the display by running XTREEINS. XTREEINS lets you install XTREE for your particular monitor, and reduces flickering that sometimes appears on certain types of screens.

You can also use XTREEINS to change the screen attributes and colors of your display if you have a color monitor.

To run XTREEINS, you must have the files XTREE.EXE, XTREEINS.EXE, and XTREEINS.DAT in the same directory. Log onto or specify the directory that contains these files, type XTREEINS and press **Enter**. The screen displays this menu:

```
            XTREE (tm) Installation Program Vx.x

A - Install XTREE for your monitor type
B - Change the display attributes or colors used by XTREE
C - Exit this install program

    Enter Option (A,B,C):
```

If you want to install XTREE to correct the screen image, choose option A. If you want to change the display attributes or colors, choose option B. Choose C when you want to exit XTREEINS. The following sections describe these options.

Option A — Installing XTREE for your monitor type

This option lets you modify the monitor configuration so you can improve the image you see when you use XTREE.

You can also use this option to restore the original default values for XTREE and cancel all the changes you made previously with XTREEINS.

When you press **A**, this menu displays:

```
          * * * Select your display type * * *

A - Quick Display
     This type should be selected for most configurations.
     However, some monitors cannot keep up with XTREE when
     it displays information, and 'snow' or flickering lines
     may appear from time to time. If this is the case with
     your monitor, select display type B.

B - Normal Display
     This type displays the XTREE screens slower so they are
     clearer.

   ESC - Main Menu, no changes

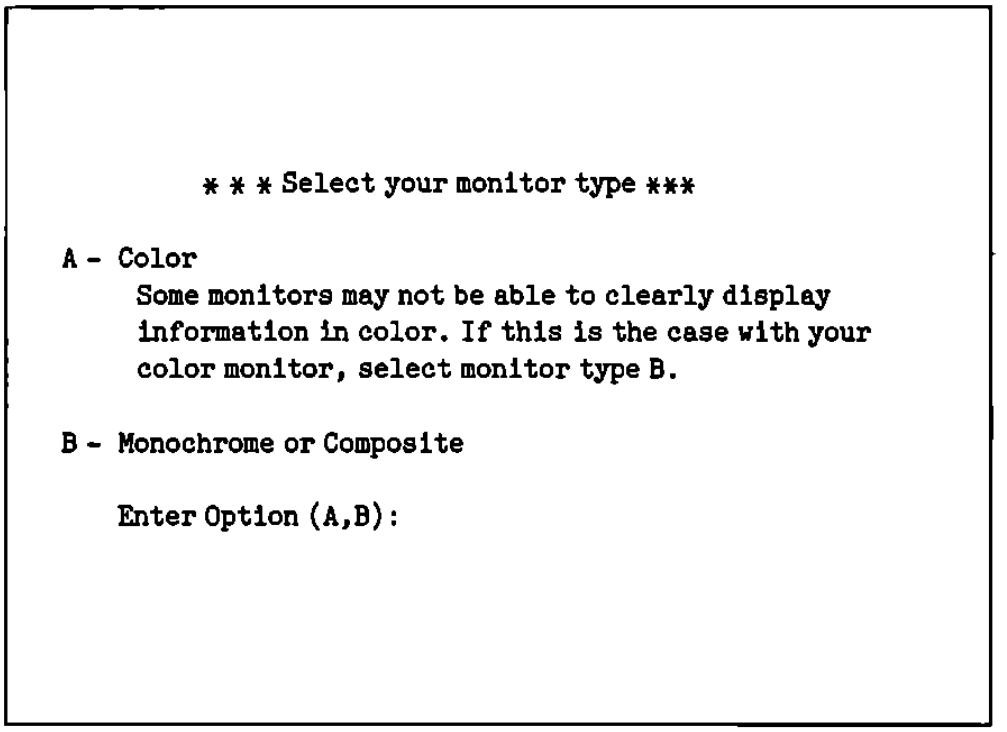
   Enter Option (A,B, Esc):
```

If you have not had any problems with the way XTREE displays on your screen, press **A** to continue displaying in the Quick Display mode. If, however, your screen image contains snow—which may happen if you have installed a color/graphics adapter—press **B** to change to the Normal Display. The Normal Display slows down refreshing the screen in XTREE so the image you see is clearer. To return to the main menu without making any changes, you can press **Esc** any time you are in the menu.

Note

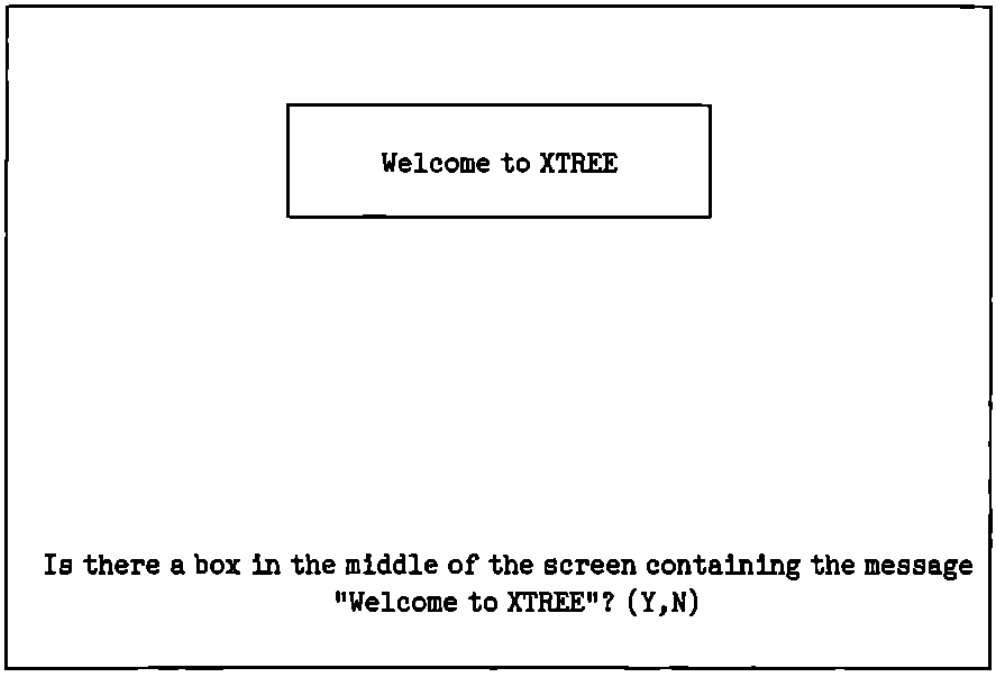
Because the screen responds slower in Normal mode, XTREE also responds slower to your commands.

After you choose either A or B, this menu appears:


* * * Select your monitor type ***
A - Color
Some monitors may not be able to clearly display information in color. If this is the case with your color monitor, select monitor type B.
B - Monochrome or Composite
Enter Option (A,B):

If you have a monochrome or composite monitor, select **B**. If you have a color monitor and are not having any problems with the way XTREE displays on your screen, select **A**. However, if you are having display problems with a color monitor, select **B**.

The following screen appears:



If you can see the box clearly, you should be able to use XTREE without any display problems. If you cannot see the image clearly, you need to try installing the program again. Answer either **Y** for Yes or **N** for No.

If you press **Y**, a prompt asks if you want to save your choices for monitor type. Press **Y** if you do. The changes you make become the new defaults and remain in effect until you change them again with XTREEINS.

The main menu now appears. If you want to exit the program press option **C**. (If you want to return to the original default values, see the section called "Restoring original values" at the end of this description.)

If you press **N**, the main menu appears. You can either exit the program or continue using it (XTREEINS and XTREE ignore any changes you made).

If you cannot see the box after trying both Quick and Normal mode, follow these steps:

1. Select option **A** on the main menu.

2. Select option **B**, Normal Display, on the display type menu.

3. Select the appropriate monitor type on the monitor type menu.

4. Answer **Y** to the prompt asking if you can see the box (even if you can't) and to the save monitor type prompt.

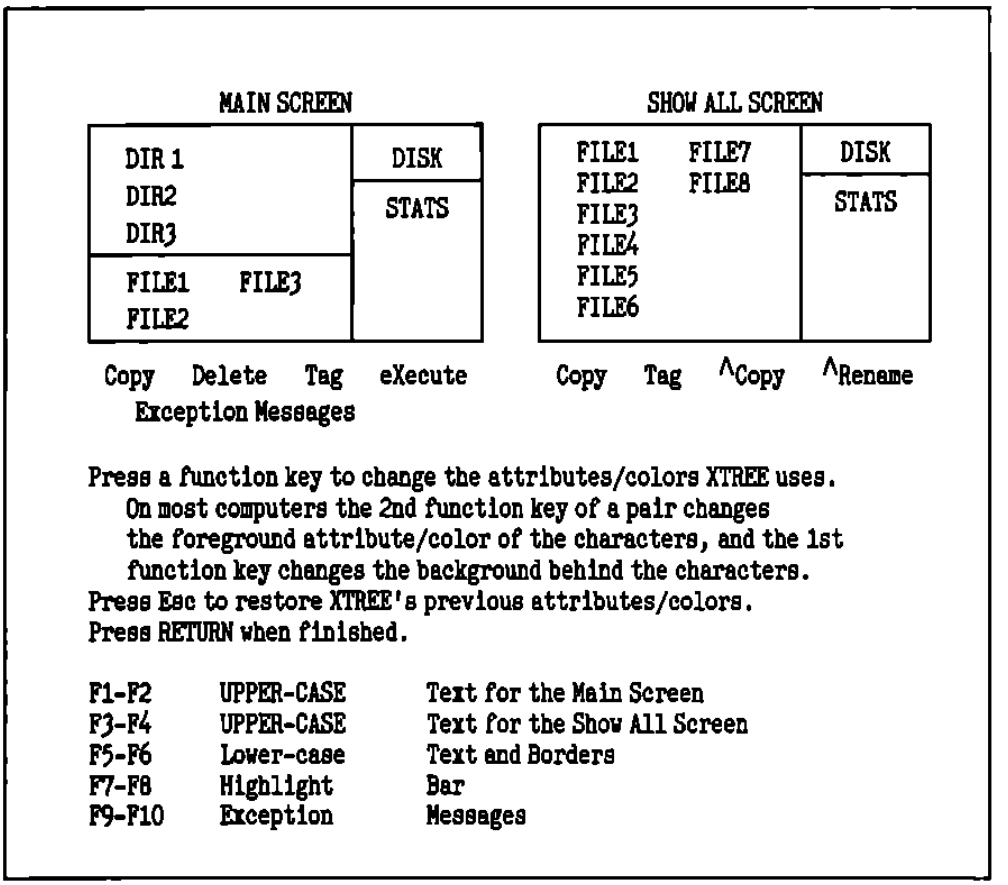
5. When the main menu appears again, select option **B**.

6. When the next screen appears, follow the instructions for changing display attributes or colors. Keep pressing the function keys until you get a good display. Then follow the instructions to install your changes and exit the program.

The next time you load XTREE, you should be able to see it clearly.

Option B — Changing display attributes or colors

If you choose option B from the main menu, this sample screen appears to let you modify the attributes and colors for XTREE:



You can now use the function keys to alter the screen attributes and select different color combinations (if you have a color monitor). If you have a monochrome monitor, you can reverse the highlight/lowlight combination. Because different monitors respond differently to the function keys, you can find the combination you like the most by pressing the function keys until you see the best one. (Of course, you can always use XTREEINS again later, if you don't like the combination you choose.)

You can press **Esc** any time you are in this menu to cancel any changes you have made and XTREEINS restores the default values.

When you are through making changes, press **Enter**. A prompt asks if you want to install the changes you have made. Press **Y** for Yes or **N** for No. If you press **Y**, your new values remain in effect until you change them again with XTREEINS. (If you want to return to the original default values, see "Restoring original values" below.) If you press **N**, XTREEINS ignores your changes and restores the default values. The main menu appears on the screen.

Option C—Exiting XTREEINS

When you are through using XTREEINS, select option **C** from the main menu to exit the program and return to the system prompt.

You can now load XTREE to test the changes you made. If you still don't like the display, you can go back into XTREEINS and make other modifications.

Restoring original values—If you want to return to the original default values for displaying XTREE (the ones it used before you made any changes), follow these steps. Type **XTREEINS** at the command prompt. Select the **A** option from the main menu, then the **A** option from the display type menu, and then either **A** or **B** from the monitor type menu (whichever you have). Answer **Y** to both the box prompt and the prompt to save your changes.

On the main menu, press **C** to exit XTREEINS. From the command prompt, load XTREE to check the display.

Chapter 6

Configuring Your System

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Defining the CONFIG.SYS File

When you configure your system, you instruct MS-DOS to set up your computer according to your specific requirements. You specify your requirements in a configuration file called CONFIG.SYS. The CONFIG.SYS file contains configuration commands that define system information.

The standard system information defined by MS-DOS is adequate for running most applications. You only need to create a CONFIG.SYS file for certain applications and system requirements. If you need to define special system information, your software documentation will specify the necessary information.

System information you can enter in the CONFIG.SYS file includes the following (the name in parentheses is the configuration command):

- Extended checking of **Ctrl Break** or **Ctrl C** (BREAK)
- The number of buffers you wish to allocate in memory (BUFFERS)
- The country whose date and time format you'll use (COUNTRY)
- Any device drivers you want to install (DEVICE)
- The number of file control blocks (FCBs) that can be open at any one time (FCBS)
- The number of files that can be open at any one time (FILES)
- The number of drives that MS-DOS can access (LASTDRIVE)
- The name of a command processor that MS-DOS loads instead of COMMAND.COM (SHELL)
- Dynamic use of stack frames (STACKS).

Each time you start your system, MS-DOS searches the root directory of the current drive for the CONFIG.SYS file. If CONFIG.SYS does not exist, MS-DOS uses default values for your system configuration.

You can create a CONFIG.SYS file with any text processor or you can use the MS-DOS editor, EDLIN. (EDLIN is described in Chapter 8, Programming Tools.) You can also use the COPY CON command.

Store the CONFIG.SYS file in the root directory of your system disk. Whenever you add or change commands in the CONFIG.SYS file, you must restart MS-DOS for the new system configuration to take effect.

Note
The SELECT command creates a CONFIG.SYS file with the COUNTRY configuration command. If you have used the SELECT command, you can use EDLIN or any other text processor to add commands to the existing CONFIG.SYS file.

Allocating Memory

Your computer consists of two types of memory: random access memory (RAM) and read-only memory (ROM).

RAM is read/write memory, which means you can store data in RAM as well as read information from it. RAM is called volatile memory because when you turn the computer off, the information stored in RAM is erased.

ROM is memory that can be read but not written to or altered. ROM provides permanent storage for program instructions, such as the boot program that starts the computer and the basic input/output system (BIOS). ROM is called nonvolatile memory because the information stored in ROM cannot be erased; it is always available to the system.

The RAM that comes with your computer is called standard RAM. You can also add expansion cards to your computer to increase the amount of available RAM. This additional memory is called extended memory and is located above 1MB.

MS-DOS cannot directly access extended memory. To use memory above 1MB, you must allocate the memory as a virtual (RAM) disk, a print spooler, or a disk cache.

With this version of MS-DOS, you can also use extended memory as expanded memory. Expanded memory is based on the expanded memory specification (EMS) developed jointly by Lotus®, Intel®, and

Microsoft (referred to as LIM-EMS). Expanded memory lets programs access additional RAM even though the memory is not directly accessible by MS-DOS.

MS-DOS lets you use standard, extended, or expanded memory as a disk drive, called a virtual disk (sometimes called a RAM disk). Virtual disks are located in RAM and have the access speed of internal memory. MS-DOS can access programs or data files in a virtual disk much faster than if the data is located on a diskette or hard disk.

Remember that any data stored in a virtual disk is erased whenever you turn off the computer. Be sure to copy data from a virtual disk to a physical disk on a regular basis.

If you create a virtual disk in standard RAM, the amount of memory available to the operating system and application programs is decreased.

If you add memory expansion cards to your computer, you allocate the additional memory using the MS-DOS device drivers VDISK.SYS and EEMM.EXE. How you allocate the memory depends on the software you are using. You can run any software written to use the LIM-EMS specification. Your software documentation indicates if your application uses expanded memory.

The VDISK.SYS and EEMM.EXE device drivers are described later in this chapter.

Opening Files

You can specify the number of files that can be open at one time in your CONFIG.SYS.

Some application programs open files with file control blocks (FCBs) and others use file handles. MS-DOS uses the information stored in FCBs and file handles to access the files.

You can use the FCBS or the FILES configuration command if your application program opens a large number of files at one time. These commands are described later in this chapter.

Identifying Block Devices

All block devices are identified by a single alphabetic character (A through Z). Therefore, the number of block devices you can install in your computer is limited to 26. Block devices include physical drives, hard disk partitions, and device drivers. (The term block refers to the way the device transfers data; all disk drives transfer data in blocks.)

MS-DOS assigns a letter to each block device, starting with A. The first physical internal diskette drive is drive A; the second internal diskette drive is B. MS-DOS always uses both A and B for diskette drives, even if a computer has only one diskette drive.

MS-DOS assigns the letter C to the hard disk drive.

Other block devices are named in the order that they appear in your CONFIG.SYS file. The first device is assigned the letter D if you have a hard disk drive (with only one partition) or the letter C if you do not have a hard disk.

If you have formatted your hard disk with multiple MS-DOS partitions, the device drivers are assigned letters following the partitions. For example, if your hard disk has three MS-DOS partitions, the partitions are assigned the letters C, D, and E. The device drivers are assigned letters starting with F.

When assigning device identifiers, MS-DOS first checks for internal diskette drives and then checks the hard disk and its partitions. Then the device drivers in the CONFIG.SYS are processed in the order they appear in the file.

The device drivers are described later in this chapter.

Configuration Constraints

Specifying configuration parameters usually requires additional memory. This decreases the amount of memory available for your application programs.

BREAK *Internal*

Purpose

Tells MS-DOS when to check for **Ctrl Break** or **Ctrl C**.

Format

```
BREAK = ON
BREAK = OFF
```

Description

Use this configuration command to turn on or off the MS-DOS abort current command function.

When BREAK is OFF, MS-DOS checks for **Ctrl Break** or **Ctrl C** only when your program requests standard input, output, print, and auxiliary operations. The default is OFF.

If BREAK is ON, MS-DOS checks for **Ctrl Break** or **Ctrl C** every time your program accesses the system. ON improves the ability to abort programs but slows the system. Only set BREAK to ON when you need the extra **Ctrl Break** or **Ctrl C** checking.

BUFFERS *Internal*

Purpose

Sets the number of disk buffers allocated in memory.

Format

BUFFERS = *nnn*

Description

MS-DOS uses disk buffers to store data when reading from and writing to disk. How many buffers you allocate depends on the type of applications you use and the amount of memory in your computer.

For applications that randomly read and write records (such as many BASIC and data base applications), you can speed up access time by increasing the number of buffers. For applications that sequentially read and write records, allocating more buffers does not increase performance.

Each additional buffer requires 528 bytes of memory. This decreases the amount of memory available for your application programs.

To determine how many buffers you need, run some of your application programs with the BUFFERS command set to different values. For applications such as word processing, set the number of buffers between 10 and 20 for best performance. If you plan to create a lot of subdirectories, set the number to a value between 20 and 30.

You can allocate from 2 to 255 buffers with the BUFFERS command. The default number of buffers is 2. If your computer includes a diskette drive that reads diskettes with more than 360KB of data, then the default is BUFFERS = 3. Memory size determines the default as follows:

RAM size	*Default*
Greater than 128KB	BUFFERS = 5
Greater than 256KB	BUFFERS = 10
Greater than 512KB	BUFFERS = 15

COUNTRY *Internal*

Purpose

Selects display parameters that are country dependent, such as the date and time format, currency symbols, and decimal separator, and activates a code page.

Format

```
COUNTRY = code[,[page][,[d:][path]filename]]
```

Description

Use this command to configure your system for a specific country. All system disks distributed by Epson automatically configure the system for the country of sale. Therefore, only use this command when you frequently use the layout of a different country.

In the COUNTRY command, *code* specifies the 3-digit country code for a particular country or language. The *page* parameter specifies the code page that you want to use for the selected country (most countries have two code pages). The optional file specification identifies the file that contains country-specific information.

The valid country codes and code pages are:

Country or Language	*Country Code*	*Code Pages*
Arabic countries	785	437
Australia	061	437, 850
Belgium	032	437, 850
Canada (English)	001	437, 850
Canada (French)	002	863, 850
Denmark	045	865, 850
Finland	358	437, 850
France	033	437, 850
Germany	049	437, 850
Hebrew	972	437
Italy	039	437, 850
Latin America	003	437, 850
Netherlands	031	437, 850

Country or Language	*Country Code*	*Code Pages*
Norway	047	865, 850
Portugal	351	860, 850
Spain	034	437, 850
Sweden	046	437, 850
Switzerland	041	437, 850
United Kingdom	044	437, 850
United States	001	437, 850

If you do not include the COUNTRY command in the CONFIG.SYS file, MS-DOS uses these default values (and assumes that the COUNTRY.SYS file is in the root directory of the current drive):

Country code = 001
Code page = 437
Country information file = \COUNTRY.SYS

The format for this COUNTRY command would be:

```
COUNTRY = 001,437,\COUNTRY.SYS
```

Note
MS-DOS automatically enters the COUNTRY command into a CONFIG.SYS file when you use the SELECT command.

Examples

To set up country-dependent information for Latin America, include the following command in your CONFIG.SYS file:

```
COUNTRY = 003,437,C:\MSDOS\COUNTRY.SYS
```

MS-DOS searches for the COUNTRY.SYS file in the MSDOS directory of drive C.

To set up country-dependent information for the Hebrew language using the default code page and a specific (user-supplied) country information file called HEBREW.SYS, include the following command in your CONFIG.SYS file:

```
COUNTRY = 972,,C:HEBREW.SYS
```

The default code page is 437. MS-DOS searches the root directory of drive C for the country information file.

To set up country-dependent information for French-speaking Canada, include the following command in your CONFIG.SYS file:

```
COUNTRY = 002
```

MS-DOS uses the default code page, 863, and searches the root directory of drive C for the COUNTRY.SYS file.

DEVICE

Internal

Purpose

Installs the specified device driver during system startup.

Format

`DEVICE = [d:][path]filename [parameters]`

Description

A device driver is a set of instructions that controls peripheral devices or other software programs. Device drivers enable MS-DOS to communicate properly with your peripheral devices and software programs.

MS-DOS loads the standard device drivers that support the standard input, output, printer, hard disk drive, and diskette drive(s). Use the DEVICE command to replace and/or add to the standard drivers.

MS-DOS includes several useful device drivers, which are described later in this chapter. The following are drivers:

ANSI.SYS	Provides screen and keyboard control
DISPLAY.SYS	Supports code page switching for the console device (CON)
DRIVER.SYS	Assigns new logical names to diskette drives
EEMM.EXE	Supports expanded memory (LIM-EMS)
PRINTER.SYS	Supports code page switching for PRN, LPT1, LPT2, and LPT3
VDISK.SYS	Supports virtual (RAM) disks

When you buy a new device, such as a mouse or a scanner, you may receive device driver software. Install the device driver using the DEVICE command in your CONFIG.SYS file. To install a new driver, make sure the device driver file is in the directory you specify in the DEVICE command.

Note
COUNTRY.SYS and KEYBOARD.SYS are device drivers that are loaded automatically by MS-DOS. Do not attempt to load either of these drivers with the DEVICE command.

Example

To use the ANSI escape sequences described in Appendix E, include the following command in your CONFIG.SYS file:

```
DEVICE = ANSI.SYS
```

MS-DOS searches the root directory of the default drive for the ANSI.SYS file. If it finds the file, MS-DOS replaces all keyboard input and screen output with the ANSI escape sequences.

FCBS

Internal

Purpose

Specifies the number of file control blocks (FCBs) that can be open at one time.

Format

FCBS = *m*,*n*

Description

FCBs are used by many application programs to create, open, read, write, and delete files. One FCB is set up for each file that is opened.

The FCBS command is necessary only if you are using a network system and the SHARE command. Without file sharing, MS-DOS can set up any number of FCBs.

m is a number from 1 to 255 and specifies the total number of files that can be used concurrently. The default value is 4.

n is a number from 0 to 255 and specifies the number of opened files that cannot be closed by MS-DOS if a particular application attempts to open more than *m* files. Only the first *n* files are protected from being closed. The default value is 0.

Whenever a request is made to open more than *m* files, MS-DOS checks for the oldest FCB. MS-DOS closes this file automatically unless it is protected by the value set for *n*.

If the number of computers in the network system is small, the default values of 4,0 are usually sufficient. The only restriction on the value of *m* and *n* is that *m* must be greater than or equal to *n*. However, if you set *m* = *n*, MS-DOS cannot close a file if a program tries to open more than *m* files.

When you use the FCBS command in your CONFIG.SYS file, the resident size of MS-DOS is increased. This means the amount of space available to your application programs is decreased.

Example

To set the total number of FCB files that can be open at one time to 4 and to protect the first two files from being closed, include this command in your CONFIG.SYS file:

```
FCBS = 4,2
```

In this case, if you have four files open and you open another file, MS-DOS closes the third file that was opened; the first two files that were opened are protected from this type of closure. If you try to access the third file that is now closed, you see this message:

```
FCB unavailable
```

FILES

Internal

Purpose

Sets the maximum number of files that can be open at one time.

Format

FILES = *nnn*

Description

This command affects only files opened and accessed with file handles. It does not affect files opened with FCBs.

The number of files you set here depends on your installation. This is the maximum number of open files in the entire system.

The *nnn* setting can be a number from 8 to 255. The default is 8.

MS-DOS automatically opens five standard files: input, output, error, printer, and auxiliary device. These five files are included in the number you set; therefore, if you set FILES = 10, MS-DOS can open the five standard files and five additional files.

If you run an application program that returns an error message indicating an insufficient number of files, include the FILES command in your CONFIG.SYS file to increase the number of files that can be open.

Example

To allow 20 files to be open at one time, include the following command in your CONFIG.SYS file:

```
FILES = 20
```

LASTDRIVE *Internal*

Purpose
Sets the last valid drive letter that MS-DOS recognizes.

Format
LASTDRIVE = *x*

Description
This command sets the maximum number of drives that can be accessed by MS-DOS.

The *x* parameter is any letter of the alphabet. The minimum value for *x* is the letter equivalent of the number of physical drives installed in your computer. The maximum value is Z, which is equal to 26 drives. The default is E.

This command is useful in a network environment and if you routinely use the SUBST command.

Example
If your system has two diskette drives, one hard disk drive with two MS-DOS partitions, and four virtual disks, enter this command in your CONFIG.SYS file:

```
LASTDRIVE = H
```

SHELL

Internal

Purpose

Specifies the name and location of a command processor.

Format

SHELL = [*d*:][*path*]*filename* [*/switches*]

Description

Use this command to specify a top-level command processor, called a shell, to load in place of COMMAND.COM. You can also use this command if you store COMMAND.COM in a directory other than the root directory of the system disk.

Whenever you boot the system with a CONFIG.SYS file that includes the SHELL command, MS-DOS starts using the specified command processor. This command processor interprets the commands you enter.

Be sure to specify the complete filename of the command processor if it is not in the root directory of the disk from which you are starting the system. If you do not include the SHELL command, the default is COMMAND.COM.

COMSPEC is an environment variable that also specifies the command processor. MS-DOS uses the COMSPEC variable whenever it reloads any transient part of the command processor. Therefore, MS-DOS sets this variable to the file specification you enter in the SHELL command.

If you create a command processor that accepts switches, you can include these switches (such as /C or /P) on the SHELL command line. If you are identifying the location of COMMAND.COM, you can also include the /C, /E, and /P switches.

Remember that the MS-DOS internal commands and batch processor reside in COMMAND.COM. If you create a command processor, these functions are available only if you duplicate them in the new command processor.

Example

If you store COMMAND.COM in a subdirectory called MSDOS on drive C and you want to allocate up to 3000 bytes for the environment table, place this command in your CONFIG.SYS file:

```
SHELL = C:\MSDOS\COMMAND.COM /P /E:3000
```

STACKS

Internal

Purpose

Sets the number of available stack frames and their size.

Format

STACKS = *m*,*n*

Description

MS-DOS uses stack frames to process hardware interrupts. When a hardware interrupt occurs, MS-DOS allocates one free stack frame to process the interrupt. When the interrupt is complete, MS-DOS releases the stack frame.

The number of stack frames, *m*, can be from 0 to 64. The size of the stack frames, *n*, can be from 0 to 512 bytes.

If you set STACKS = 0,0, MS-DOS does not dynamically allocate stack frames.

If you do not include the STACKS command in your CONFIG.SYS file, the default for 8086- and 8088-based computers is:

```
STACKS = 0,0
```

For all other computers, the default is:

```
STACKS = 9,128
```

If you have a large number of devices installed in your computer, you may experience errors due to hardware interrupts. You would see this message:

```
Fatal: Internal Stack Failure, System Halted
```

If you see this message, increase the number of stack frames, which allows the system to process more hardware interrupts. Normally, you'll want to increase the number of stack frames rather than increase the size of the individual frames.

Allocating additional stack space decreases the amount of memory available to your application programs. Therefore, only change stack allocations if necessary.

Example

To allocate eight stacks of 512 bytes each for hardware interrupt handling, include this command in your CONFIG.SYS file:

```
STACKS = 8,512
```

Device Drivers

A device driver is a set of instructions that acts as a liaison between MS-DOS and any other software program or peripheral device you are using. Device drivers enable MS-DOS to communicate properly with your monitor, keyboard, disk drive(s), and other devices.

You install device drivers in your CONFIG.SYS file to customize and optimize your system. The following device drivers are available with this version of MS-DOS:

ANSI.SYS
DISPLAY.SYS
DRIVER.SYS
EEMM.EXE
PRINTER.SYS
VDISK.SYS

ANSI.SYS *External*

Purpose
Provides screen and keyboard control.

Format
DEVICE = [*d*:][*path*]ANSI.SYS

Description
You can use the ANSI.SYS device driver to control cursor movement, erase all or part of the screen, change the screen display, and reassign key functions. These changes are defined by character strings called escape sequences.

The ANSI.SYS device driver contains the escape sequences required by some application programs to control keyboard and screen operation. The ANSI escape sequences are described in Appendix E.

DISPLAY.SYS *External*

Purpose

Supports code page switching for the console device (CON).

Format

```
DEVICE = [d:][path]DISPLAY.SYS
         CON[:]=(type,[,[hwcp][,n]])

DEVICE = [d:][path]DISPLAY.SYS
         CON[:]=(type,[,[hwcp][,(n,m)]])
```

Description

You need to use this device driver only if you want to do code page switching on your console device.

If you have the proper supporting hardware, you can install this device driver to switch between prepared code pages for your console. See Chapter 9, Code Page Switching, for more information about using this device driver to support code page switching.

You specify the following parameters:

Parameter	*Description*
type	Display adapter. Valid values: MONO (monochrome display adapter) CGA (color graphics adapter) EGA (enhanced graphics adapter) LCD (liquid crystal display)
hwcp	Hardware code page built into the display adapter. Valid values: 437 United States 850 Multilingual 860 Portugal 863 French Canada 865 Norway

Parameter	*Description*
n	Number (from 0 to 12) of additional code pages you want to use. MONO and CGA do not support code page switching; therefore, *n* must be zero. For EGA and LCD, *n* defaults to 1.
m	Number (from 0 to 2) of subfonts supported for each code page. MONO and CGA do not support other fonts; therefore *m* must be zero. For EGA, the default is 2. For LCD, the default is 1.

Example

To set up code page switching for an EGA display adapter with a built-in hardware code page of 437 and the ability to add two more code pages, enter this command in your CONFIG.SYS file:

```
DEVICE = C:\DOS\DISPLAY.SYS CON: = (EGA,437,2)
```

DRIVER.SYS *External*

Purpose

Assigns new logical names to diskette drives.

Format

```
DEVICE = [d:][path]DRIVER.SYS /D:ddd [/T:ttt]
         [/S:ss] [/H:hh] [/C] [/N] [/F:f]
```

Description

Use this device driver to assign new logical names to your diskette drives or to add external diskette drives to your computer.

DRIVER.SYS lets you access and use a disk device by referencing a logical drive letter.

With DRIVER.SYS in your CONFIG.SYS file, you can copy files from one drive to the *same* drive when the system has more than one diskette drive. Without DRIVER.SYS, MS-DOS automatically copies files to the second drive.

Switch	*Function*
/D:*ddd*	Specifies the physical drive number. A physical drive has a value of 0 through 255. Numbers 0 to 127 identify diskette drives and 128 to 255 identify hard disk drives. The first physical diskette drive is 0 and it is referenced as drive A from the command prompt. The second physical diskette drive is 1. To specify a third physical diskette drive, which must be external, use 2. The first physical hard disk is 128, the second hard disk is 129, and so forth.
/T:*ttt*	Specifies the number of tracks per side (1–999). The default is 80 tracks per side.
/S:*ss*	Specifies the number of sectors per track (1–99). The default is 9 sectors per track.

/H:*hh* Specifies the maximum number of heads (1–99). The default is 2 heads.

/C Specifies that changeline (door lock) support is required (only for computer models that support diskette changeline).

/N Specifies the physical drive is a non-removable block device such as a hard disk.

/F:*f* Specifies the device type. Valid values are:

0 = 160/180KB or 320/360KB diskette drive
1 = 1.2MB diskette drive
2 = 720KB diskette drive
5 = hard disk
7 = 1.44MB diskette drive

The default is 2.

When you specify additional physical drives with DRIVER.SYS, include LASTDRIVE = *x* in your CONFIG.SYS file (*x* must be a letter from E to Z). See the LASTDRIVE command in this chapter.

Examples

To copy from an internal 1.2MB diskette drive to the same internal drive, use DEVICE = DRIVER.SYS with these switches:

```
DEVICE = DRIVER.SYS /D:Ø /T:8Ø /S:15 /H:2 /C
         /F:1
```

This assigns the logical drive letter D to the first diskette drive. It can now be referenced as drive A *and* drive D. In this example, your computer has two internal diskette drives (the first one is 1.2MB) and one hard disk.

You can now copy a file (called ONEFILE) from a diskette in drive A to another diskette in drive A (referenced as drive D), using the COPY command in the following manner:

```
COPY A:ONEFILE D:
```

To set up a logical drive letter of D for a 720KB external diskette drive on a computer with one internal diskette drive and a hard disk, use DEVICE = DRIVER.SYS with this format:

```
DEVICE = DRIVER.SYS /D:2
```

To be able to copy from a 720KB external diskette to the same drive, use DEVICE = DRIVER.SYS with the above format, but include it twice in the CONFIG.SYS file (the diskette drive can now be referenced as drive D and drive E):

```
DEVICE = DRIVER.SYS /D:2
DEVICE = DRIVER.SYS /D:2
```

EEMM.EXE *External*

Purpose

Supports expanded memory on 80386-based computers.

Format

DEVICE = [*d*:][*path*]EEMM.EXE

Description

This device driver lets you use the extended memory on your 80386-based computer as expanded memory. This expanded memory supports all the functions of LIM-EMS, Version 3.20.

When MS-DOS encounters this configuration command in your CONFIG.SYS, it allocates all available extended memory to expanded memory. Therefore, make sure this command follows any other configuration commands that use extended memory.

Only install this device driver if you have an application program that uses expanded memory (EMS).

If you want to install a virtual disk in expanded memory, the EEMM.EXE command must precede the VDISK.SYS command.

Note

Do not attempt to execute this EEMM.EXE device driver as a command. Only enter EEMM.EXE as a device driver in your CONFIG.SYS file.

Example

To install virtual disks (1024KB each) in both extended and expanded memory, include the following commands in your CONFIG.SYS file:

```
DEVICE = VDISK.SYS 1024 /E
DEVICE = EEMM.EXE
DEVICE = VDISK.SYS 1024 /A
```

The VDISK.SYS device driver is described later in this chapter.

PRINTER.SYS *External*

Purpose

Supports code page switching for parallel printers.

Format

```
DEVICE = [d:][path]PRINTER.SYS LPTx(:) =
         (type[,[hwcp][,n]])
```

Description

You need to use this device driver only if you want to do code page switching on your parallel printer (LPT1, LPT2, or LPT3).

If you have the proper supporting hardware, you can install this device driver to switch between prepared code pages for your printer. See Chapter 9, Code Page Switching, for more information about using this device driver to support code page switching.

You specify the following parameters:

Parameter	*Description*
LPT*x*	Printer device. Valid values: LPT1 LPT2 LPT3 (You can substitute PRN for LPT1)
type	Printer. Valid values: 4201 (IBM Proprinter II Model 4201) 5202 (Quietwriter III Model 5202)

Parameter	*Description*
hwcp	Hardware code page built into the printer. Valid values: 437 United States 850 Multilingual 860 Portugal 863 French Canada 865 Norway
	Number (from 0 to 12) of additional code pages you want to use. This number is hardware dependent.

Example

To set up code page switching for a printer that emulates the IBM Proprinter II Model 4201, such as the Epson FX-286™, and that has a hardware code page of 437 built-in and the capability to access one more code page, enter this command in your CONFIG.SYS file:

```
DEVICE = C:\MSDOS\PRINTER.SYS LPT1: =
         (4201, 437,1)
```

VDISK.SYS *External*

Purpose

Supports virtual (RAM) disks.

Format

```
DEVICE = [d:][path]VDISK.SYS [cap] [sec] [dir] [/A]
         [/E]
```

Description

VDISK.SYS sets up an area in RAM memory that can be used to simulate the operations of a real disk drive. This area, once established, is commonly referred to as a virtual disk or a RAM disk.

The advantage of using a virtual disk is speed. Because RAM memory can be accessed quickly by the computer, all disk read/write operations are performed many times faster than using an actual disk. However, the contents of RAM memory are lost each time your computer is reset or turned off.

You can customize your virtual disk by including parameters on the command line for virtual disk size, sector size, and number of directory entries. If you have extended memory installed in your computer, you can use the /E switch to create a virtual disk in memory at or above 1MB. If you have installed the EEMM.EXE device driver or added hardware that supports expanded memory, you can use the /A switch to create the virtual disk in expanded memory.

The parameter *cap* represents the size of the virtual disk in kilobytes. The range is from 1 to the amount of memory available on your computer. If you don't specify a cap value, the default of 64KB is assigned, subject to the following conditions:

- If you specify an unacceptable value for *cap* (less than 16 or greater than available memory), the default value of 64KB is assigned.

- VDISK always leaves at least 64KB of RAM memory for use by the system. Therefore, if you specify a value that would cause less than this amount to be set aside, VDISK automatically decreases its own size accordingly.

- If you have installed more than one virtual disk in the CONFIG.SYS file and a subsequent DEVICE = VDISK.SYS command finds less than 64KB of memory left, VDISK does not install the extra virtual disk. You see an error message.

The parameter *sec* selects the sector size in bytes. Valid sizes are 128, 256, or 512. If you omit a size or enter an incorrect size, the default value of 128 is assigned.

When MS-DOS reads a disk, it always reads a minimum of one sector. If you intend to save a lot of small files (less than 128 bytes) to the virtual disk, use a value of 128 for *sec*. If you are saving large files (more than 512 bytes) to the virtual disk, use a value of 512 to speed up disk access.

The parameter *dir* specifies the number of directory entries recognized by the virtual disk. Acceptable values are from 2 to 1024. If you do not specify *dir*, a default value of 64 is assigned.

VDISK modifies the value for *dir* as it is loaded. VDISK automatically selects the correct number of directories that fill a sector. Each directory entry uses 32 bytes. Therefore, if you choose a sector size of 128 bytes, the number of directories are always a multiple of 4, regardless of the value used for *dir*. For 256 sectors, the multiple is 8 and for 512 sectors is 16.

/A allows you to use VDISK with expanded memory (LIM-EMS). Expanded memory is an option for your computer. Once installed, it allows your computer to access more than 640KB of memory. You cannot use /A with /E.

/E allows you to use VDISK with extended memory. Extended memory is an option for your computer. Once installed, it allows your computer to access memory at and beyond 1MB. You cannot use /E with /A.

Once you place a DEVICE = VDISK.SYS command in the CONFIG.SYS file, you see messages similar to these each time you turn on or reset your computer:

```
RAMDrive Version 1.16 virtual disk x:
   Disk size: xxxk
   Sector size: xxx bytes
   Allocation unit: x sectors
   Directory entries: xx
```

These messages are displayed before the date and time prompts.

To configure your system with more than one virtual disk, simply add the required number of DEVICE = VDISK.SYS commands to your CONFIG.SYS file. The only limit to the number of drives you can install is the amount of RAM memory available.

Example

To install a virtual disk of 160KB capacity with 512 sectors and 64 directories in standard memory, place the following command in CONFIG.SYS:

```
DEVICE = VDISK.SYS 160 512 64
```

Chapter 7

Batch Processing Commands

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Creating Batch Files

You may find yourself typing the same sequence of commands over and over to perform some task. With MS-DOS you can put this command sequence into a special file called a batch file. You can then run the sequence of commands by simply typing the name of the batch file. MS-DOS executes the commands in a batch file just as if you had typed each command from the keyboard.

You can create a batch file using a text editor, such as EDLIN, or using the COPY command, as shown here. When you create a batch file, you must include an extension of .BAT. When you run the batch file, you type the filename only; you don't type the file extension.

To create a batch file to format and check a new disk, follow these steps:

1. Type the following command and press **Enter**:

   ```
   COPY CON CHECKNEW.BAT
   ```

   This command tells MS-DOS to copy the information from the keyboard to the file CHECKNEW.BAT.

2. Type the following lines, pressing **Enter** after each line:

   ```
   REM    This is a file to format and
   REM    check new disks.
   REM    It is named CHECKNEW.BAT.
   PAUSE  Insert new disk in drive B:.
   FORMAT B: /V
   CHKDSK B:
   ```

   REM and PAUSE are batch file commands described later in this chapter.

3. After typing the last line, press **Ctrl Z** followed by **Enter** to save the batch file. MS-DOS displays the following message:

   ```
   1File(s) copied
   ```

4. To execute the file, type the following command and press **Enter**:

   ```
   CHECKNEW
   ```

   MS-DOS executes the commands in sequence just as if you typed each line as an individual command.

Remember the following things about batch files:

- You must name each batch file with an extension of .BAT.
- To execute a batch file, you type only the filename and not the extension.
- If you press **Ctrl C** while a batch file is running, MS-DOS asks you to confirm that you want to terminate the batch process.
- If you remove a diskette that contains a batch file being processed, MS-DOS prompts you to reinsert the diskette so that it can continue processing the file.
- You can specify the name of another batch file as the last command in a batch file. MS-DOS will then execute the next batch file after it executes all the commands in the first batch.
- You can use any of the redirection symbols (| < >) in a batch file. For more information on using these symbols, see Chapter 3, Using MS-DOS Commands.
- MS-DOS ignores any line in a batch file that starts with a colon (:). Therefore, you can use the colon to add comment lines to your batch file.
- You may use an @ character preceding a command in a batch file to prevent the command line from displaying on the screen.
- Changing the directory or drive affects subsequent commands in the batch file.
- Setting environment strings affects subsequent commands in the batch file.
- Do not use internal command names for batch files.

- If you use an external command name for a batch file, be sure to store the batch file in a different directory than where the MS-DOS command is located. Otherwise, you will not be able to execute the batch file.

Using an AUTOEXEC.BAT File

An AUTOEXEC.BAT file lets you execute specific MS-DOS commands automatically when you start MS-DOS. This is useful when you want to run a specific application or set certain system parameters each time you start your computer.

When you start your computer, MS-DOS searches the root directory of the default disk drive for a file named AUTOEXEC.BAT. If it finds an AUTOEXEC.BAT file, MS-DOS immediately processes it, bypassing the date and time prompts. (If MS-DOS does not find an AUTOEXEC.BAT file, then it displays the date and time prompts.)

Because MS-DOS does not prompt you for a current date and time if you start with an AUTOEXEC.BAT file, it's a good idea to add these two commands to your AUTOEXEC.BAT file. MS-DOS needs this information to keep your directories current. See Chapter 4, Alphabetical List of MS-DOS Commands, for more information on the date and time commands.

An AUTOEXEC.BAT file can help you use MS-DOS more efficiently. You can set the date and time, set a path and any other system options you use, change the system prompt, and start executing an application program.

For example, to automatically set up your system and load the XTREE utility each time you start MS-DOS, you could create an AUTOEXEC.BAT file following these steps:

1. Type the following command and then press **Enter**:

```
COPY CON AUTOEXEC.BAT
```

This command tells MS-DOS to copy the information from the keyboard to the AUTOEXEC.BAT file. You must store the AUTOEXEC.BAT file in the root directory of your MS-DOS system disk.

2. Now type the following lines pressing **Enter** after each line:

```
DATE
TIME
PATH = C:\;C:\MSDOS;A:\
PROMPT [$P]
CLS
XTREE
```

3. After the last line, press **Ctrl Z** followed by **Enter** to copy these lines to the AUTOEXEC.BAT file.

When you start your computer with this AUTOEXEC.BAT file, MS-DOS automatically performs the following tasks:

1. Asks you to enter the date and time.
2. Sets your command search path.
3. Sets your system prompt to the current drive and directory with brackets.
4. Clears the screen.
5. Loads the XTREE utility.

You can include any MS-DOS command or series of commands in an AUTOEXEC.BAT file.

Using Replaceable Parameters

Replaceable parameters let you run batch files with different sets of data. You specify the replaceable parameters in your batch file and then enter the actual data on the command line when you execute the batch file. The replaceable parameters are %0 through %9.

For example, you can create a batch file that sorts a file based on a specific string of characters. Then each time you run the batch file, you can specify a different file and/or a different string of characters.

Follow these steps:

1. Type the following command and press **Enter**:

```
COPY CON SORTER.BAT
```

2. Type the following command lines pressing **Enter** after each line:

```
TYPE %2 ¦ FIND "%1" > %3
TYPE %3 ¦ SORT > PRN
DEL %3
```

3. Assume the following file, named CUSTOMER, exists on drive A:

```
SHORES, BETTY   NORTH
MOYNIHAN, ANN   SOUTH
KRAIG, HEIDY    NORTH
MARTIN, PETE    EAST
LENNON, PAT     SOUTH
EVANS, RICK     NORTH
```

4. To print an alphabetical list of the customers in the north, type the following command line followed by **Enter**:

```
SORTER NORTH A:CUSTOMER TEMP.FIL
```

The output on the printer looks like this:

```
EVANS, RICK     NORTH
KRAIG, HEIDY    NORTH
SHORES, BETTY   NORTH
```

The result is the same as if you had typed each of the following commands:

```
TYPE A:CUSTOMER ¦ FIND "NORTH" > TEMP.FIL
TYPE TEMP.FIL ¦ SORT > PRN
DEL TEMP.FIL
```

Remember these things when using replaceable parameters:

- You can specify up to 10 replaceable parameters (%0–%9). To use more than 10, use the SHIFT command described later in this chapter.
- MS-DOS always replaces the %0 parameter with the drive (if specified) and the filename of the batch file. (In the above example, %0 is SORTER.)
- If a filename or parameter in the batch file has a percent sign in it, you must type the percent sign twice. For example, to specify the file ABC%.DAT, you must type ABC%%.DAT.

Using Environment Variables

You can also access environment variables with replaceable parameters in a batch file. You enter the parameter with a percent sign before and after the name of the environment variable, such as %FILE%.

For example, to create a batch file that moves a file you want to delete into a separate directory, follow these steps:

1. Type the following command followed by **Enter**:

```
COPY CON MYDEL.BAT
```

2. Type the following commands, pressing **Enter** after each line:

```
ECHO OFF
ECHO Before using this batch file,
ECHO you must specify the directory.
ECHO At the MS-DOS prompt, type:
ECHO SET DELDIR = directory
ECHO Press Ctrl C to exit if you
ECHO need to set DELDIR.
PAUSE
COPY %1 %DELDIR%
DEL %1
DIR /W %DELDIR%
ECHO Complete
```

3. After the last line, press **Ctrl Z** and then **Enter**.

4. For MYDEL.BAT to work, you must create your delete directory. To create the DELETED directory, type the following command and press **Enter**:

   ```
   MD \DELETED
   ```

5. Use the SET command to specify a directory named DELETED:

   ```
   SET DELDIR = \DELETED
   ```

6. To move the file REPORT10.SLS to the delete directory, type the following command and press **Enter**:

   ```
   MYDEL REPORT10.SLS
   ```

   MS-DOS automatically replaces the %DELDIR% parameter with the directory named DELETED.

Using the Batch Processing Commands

The batch processing commands described in the remainder of this chapter add power and flexibility to your batch files. You can execute any of these batch processing commands from the MS-DOS command prompt. These commands are called batch processing commands because they are most commonly used in batch files, and because they affect batch file operations.

CALL

Internal

Purpose

Allows one batch file to call another batch file without ending the first batch file.

Format

CALL [*d:*][*path*]*filename* [*arguments*]

Description

You can use this command to execute one batch file from another batch file. MS-DOS executes the specified batch file and then returns to the calling batch file.

Use the *arguments* parameter to specify any arguments, such as replaceable parameters, required by the batch file being called.

You can specify the CALL command on any line of a batch file.

The file that you call must be a batch file (that is, it must have a .BAT extension).

A batch file can call itself. Be careful that the batch file eventually terminates.

Note

Do not use piping or redirection with the CALL command.

Example

The following sequence of commands sends control to the ERRFORM batch file if an error occurs when you format the diskette in drive A:

```
ECHO OFF
FORMAT A: /S
IF ERRORLEVEL 1 CALL ERRFORM
ECHO End of batch file
```

After the ERRFORM batch file is executed, control returns to the ECHO command that follows the CALL statement.

ECHO

Internal

Purpose

Turns on and off command echoes on your screen.

Format

```
ECHO [ON]
ECHO [OFF]
ECHO [message]
```

Description

Use ECHO to control the display of batch file commands on the screen. Normally, MS-DOS displays, or echoes, commands in a batch file while they are executing. When you turn on or reset the system, ECHO is on.

Type ECHO OFF to turn this feature off. Type ECHO ON to turn it back on.

You can display the current setting of the command by typing ECHO without the ON or OFF parameter.

If you are using a batch file, you can type ECHO *message* to display messages during the execution. These messages are displayed on the standard output device regardless of the ECHO setting.

This command does not affect the messages that are produced during command execution.

Examples

Include ECHO in a batch file such as this one:

```
ECHO OFF
REM Command display off
TREE B:
ECHO ON
TREE B:
```

When this batch file executes, the screen displays ECHO OFF but does not display the REM or TREE command. As TREE executes, the output of the TREE command displays. When ECHO is back on, the second TREE command displays. Then, as before, the output of the TREE command displays.

To turn ECHO off without displaying the command, type:

```
ECHO OFF
```

FOR

Internal

Purpose

Performs a single repetitive operation on a set of files, devices, or system parameters.

Format

FOR *%%c* IN *set* DO *command*

Description

Use the FOR command to repeat certain batch operations for each item in a list. The format of this command means FOR each item IN a set of items DO the specified command.

The parameters are:

- *c* can be any character (except the numbers 0 through 9 to avoid confusion with the %0l—%9 batch replaceable parameters)
- *set* is either a filename or a list of possible values
- *command* is any MS-DOS command.

The %%c variable applies sequentially to each item in the parameter, and then the command evaluates each item. If a member in the set of items is an expression with an asterisk (*) or a question mark (?), then the variable is set to each matching pattern from disk. You can only use * or ? in one item in the set; FOR ignores any other item in the set.

You must include two percent signs (%%) so that after batch parameter (%0–%9) processing is done, one percent sign (%) remains. If you enter only one percent sign, such as %f, it appears as an error (bad parameter reference). MS-DOS discards the %f, which makes it unavailable when you execute FOR. However, if you use FOR outside a batch file, you only need to type one percent sign.

Examples

To assemble all files with the extension .ASM, type:

```
FOR %%f IN (*.ASM) DO MASM %%f
```

To list all files in the SALES directory, type:

```
FOR %%f IN (LEDGER/SALES) DO REM %%f
```

GOTO

Internal

Purpose

Jumps to a labelled line within the same batch file.

Format

GOTO *label*

Description

Use this command to skip to another location in yout batch file. MS-DOS starts executing commands from that location. MS-DOS executes the command on the line following the label.

Typically, you use this command to skip over an unwanted portion of commands, or to return to a line in order to repeat commands.

If you do not define the specified *label* in the batch file, MS-DOS displays the error message `Label not found` and terminates the batch file.

You define a label using the colon as the first character on a line followed by the label name (*:label*). MS-DOS ignores the remainder of the line following the colon except when searching for a label. In this way, you can also use the colon to enter comments in your batch file.

Example

The following sequence of commands sends control to the END statement only if no errors occur when you format the diskette in drive A:

```
:BEGIN
ECHO OFF
FORMAT A: /S
IF NOT ERRORLEVEL 1 GOTO END
ECHO AN ERROR OCCURRED DURING FORMATTING.
:END
ECHO END OF BATCH FILE.
```

IF

Internal

Purpose

Executes a second command depending on whether a specified condition is true or false.

Format

`IF condition command`

Description

Use this command to test for some logical condition (such as an error in a previous program or the existence of a file), and then to execute another command depending on the results of the test. You can enter any valid MS-DOS command. The condition parameter is one of the following:

Condition parameter	*Result*
ERRORLEVEL *number*	This condition is true only if the previously executed program had an exit code number that is the same or higher than this *number*.
string1 == *string2*	This condition is true only if *string1* and *string2* are identical after parameter substitution (do not enter embedded delimiters in strings).
EXIST *filename*	This condition is true only if *filename* exists.
NOT *condition*	This condition is true only if *condition* is false.

Examples

To display a message based on whether or not the file called 620.TXT exists, type the following and press **Enter**:

```
IF NOT EXIST 62Ø.TXT ECHO Can't find file
```

If the file does not exist, MS-DOS displays the message:

```
ECHO Can't find file
```

To link to another file based on the exit code of a previous program, type the following and press Enter:

```
IF NOT ERRORLEVEL 3 LINK %1,,;
```

If the previously executed program did not have an exit code of three or higher, then link the file identified by the first replaceable parameter.

To transfer control based on a replaceable parameter, type:

```
IF %1 = = QUIT GOTO END
```

If the first replaceable parameter is QUIT, then transfer control to END.

PAUSE *Internal*

Purpose
Suspends execution of the batch file.

Format
PAUSE [*comment*]

Description
Use PAUSE to suspend the execution of your batch file until you press any key. Use this command in your batch file when you need to change diskettes or perform some other action.

When MS-DOS finds a PAUSE command, you see the prompt:

```
Strike a key when ready . . .
```

After you perform the desired function, press any key to continue.

Use the *comment* parameter in your PAUSE command to display a message on the screen during program suspension. If ECHO is on, your comment displays before the MS-DOS message instructing you to strike a key when ready.

You can terminate a batch job at any time. Just press **Ctrl C**. You see the prompt:

```
Terminate batch job (Y/N)? _
```

Press **N** to continue processing your batch file. Press **Y** to stop execution of the remainder of your batch. The command prompt displays.

Example

Type the following sequence of commands in your batch file. A pause occurs before MS-DOS displays the directory on drive B. This allows you to insert a new diskette in drive B.

```
DIR A:
ECHO Display the directory of drive B next
PAUSE
DIR B:
```

REM

Internal

Purpose

Adds remarks to batch files.

Format

REM [*comment*]

Description

Use this command to add comment lines in a batch file.

The only punctuation you can use in the comment are spaces, tabs, and commas.

Note

If ECHO is off, the REM comment is not displayed.

Example

You can enter the following sequence of commands in your batch file:

```
REM This file checks new disks
REM It is named NEWDISK.BAT
PAUSE Insert new disk in drive B
FORMAT B:/S
DIR B:
CHKDSK B:
```

The remark lines tell you what the file does and gives the name of the file.

SHIFT *Internal*

Purpose
Enables more than 10 replaceable parameters within a batch file.

Format
SHIFT

Description
Use this command to shift batch file parameters up one place. SHIFT makes it easier for a batch file to process a list of parameters that can vary in number. SHIFT changes the replaceable parameters by shifting up each value for %0 through %9.

Example
If your data file parameters are:

```
%0 = x
%1 = y
%2 = z
%3-%9 are empty
```

Then a SHIFT command produces the following:

```
%0 = y
%1 = z
%2-%9 are empty
```

If you give more than 10 parameters on a command line, those that appear after %9 move one at a time into %9 when you enter successive SHIFT commands.

Chapter 8

Programming Tools

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Introduction

This chapter describes the MS-DOS commands you use when you start writing your own programs. The following commands are programming tools:

Command	*Description*
DEBUG	Monitors and modifies the actual content of computer memory
EDLIN	Creates and edits text files
EXE2BIN	Converts executable (.EXE) files to binary format
LINK	Combines object code program modules into executable programs.

You can use the EDLIN editor to create any text files, including your system files such as AUTOEXEC.BAT and CONFIG.SYS.

Normally, the DEBUG, EXE2BIN, and LINK commands are used only by experienced programmers.

DEBUG

External

Purpose

Monitors and modifies the actual content of computer memory.

Format

`[d:][path]DEBUG [[d:][path]filename]`

Description

Use DEBUG to debug programs. This utility allows you to test binary and executable object files. Additionally, you can alter the contents of files and disks (this is called patching) as well as change CPU registers. With DEBUG, you do not have to reassemble a file to make minor changes. To make use of DEBUG, you need to be familiar with programming and the use of debugging tools.

You can use these two control codes with the DEBUG commands:

- **Ctrl C** aborts operation of a DEBUG command.
- **Ctrl S** halts the scrolling of the display. You can restart the display by pressing any key other than **Ctrl C** or **Ctrl S**.

Starting DEBUG—You can start DEBUG in one of two ways.

The first way to start DEBUG is to load DEBUG and then enter a specific filename.

1. At the command prompt, type the following and press **Enter**:

   ```
   DEBUG
   ```

   The DEBUG program loads and presents you with a hyphen (–) prompt.

2. Use the Name (N) command along with the filename, and include the appropriate parameters. At the hyphen prompt, type the following and press **Enter**.

   ```
   N filename parameters
   ```

For example:

```
N TESTFILE.EXE/D
```

3. Now you can execute commands to act on memory, files, registers, or disk sectors, and to load and save files.

The second way to start DEBUG is to load DEBUG and the specified file in one step.

1. At the command prompt, type the following and press **Enter** (you do not use the N command when you start DEBUG in this manner):

   ```
   DEBUG filename parameters
   ```

   For example:

   ```
   DEBUG TESTFILE.EXE/D
   ```

   This loads both the file TESTFILE and the double-precision routines for the /D parameter. It's important to use such a parameter because the file is different if you do not give the /D parameter command.

2. Now you can execute commands to act on memory, files, registers, or disk sectors, and to load and save files.

When DEBUG loads a file into memory, it starts at address 0100 hexadecimal in the lowest available segment. It also loads the number of bytes placed in memory into the BX:CX registers.

Remember these two points when using DEBUG with files:

- When working with a .COM or .EXE file, if you try to modify the program header below address 5C, DEBUG terminates.
- Do not attempt to restart a program after you see the message `Program terminated normally`. Use the N and L commands (see Table 8-1) to reload the program and then rerun it.

DEBUG command format—Each DEBUG command you use is a single letter which you follow with one or more parameters. The DEBUG commands and their parameters are shown in Table 8-1. The standard MS-DOS control and editing function keys apply while using DEBUG and you can use either upper- or lowercase commands.

Table 8-1. DEBUG commands and parameters

Commands and parameters	Function
A [*address*]	Assemble
C *range address*	Compare
D [*range*]	Dump
E *address* [*list*]	Enter
F *range list*	Fill
G [= *address* [*address...*]]	Go
H *value value*	Hex
I *value*	Input
L [*address* [*drive record record*]]	Load
M *range address*	Move
N *filename* [*filename*]	Name
O *value byte*	Output
P	Proceed
Q	Quit
R [*register-name*]	Register
S *range list*	Search
T [= *address*] [*value*]	Trace
U [*range*]	Unassemble
W [*address* [*drive record record*]]	Write

All DEBUG commands accept parameters, with the exception of the Quit command. You need not separate parameters with delimiters (spaces or commas), but you must enter a delimiter between two consecutive hex values. The following examples are equivalent:

```
dcs:1ØØ 11Ø
d cs:1ØØ 11Ø
d,cs:1ØØ,11Ø
```

When a format error occurs in a DEBUG command, DEBUG reprints the command line and displays a second line containing an arrow, which pinpoints the error. For example:

```
dcs:1ØØ cs:11Ø
        ^ error
```

You can use the following command parameters with DEBUG:

address

This is a two-part designation consisting of either an alphabetic segment register designation or a 4-digit segment address, plus an offset value. If you omit the segment designation or segment address, DEBUG uses the default. DS is the default for all commands except G, L, T, U, and W, for which the default is CS. All numeric values are hexadecimal. For example:

```
1ØØ
CS:Ø1ØØ
Ø4BA:Ø1ØØ
```

You must enter a colon between a segment designation (whether numeric or alphabetic) and an offset value.

byte

This is a 2-digit hexadecimal value that DEBUG places in or reads from an address or register.

drive

This is a 1-digit hexadecimal value identifying the drive a file loads from or writes to. The valid values are: 0 = A:, 1 = B:, 2 = C:, 3 = D:, and so forth.

list

This is a series of strings or byte values, which must be the last parameter on the command line. For example:

```
ecs:1ØØ 42 45 52 54 41
fcs:1ØØ 1FF 42 45 52 54 41
```

range

This parameter has two forms:

- *Address address* refers to two addresses.
- *Address* L *value* where *value* is the number of bytes the command is to operate on, and L80 is the default. Do not use this form if another hex value follows the *range* because DEBUG interprets the hex value as the second address of the range.

  These examples are legal:

```
CS:100 110
CS:100 L 10
CS:100
```

  This example is illegal and produces an error:

```
CS:100 CS:100
       ^ error
```

  The limit for range is 10000 hex. To specify a value of 10000 hex, type 0000 (or only 0).

record

This is a 1- to 3-digit hexadecimal value, which you use to indicate the logical record number on the disk and the number of disk sectors you want to write or load. Logical records correspond to sectors. However, their numbering differs because they represent the entire disk space.

string

This is any number of characters you enclose in quotation marks. Quotation marks can be either single (') or double ("). If you require quotation marks to delimit within a string, you can use two sets of quotation marks or a combination. For example, the following strings are legal:

```
'This "string" is okay.'
'This ''string'' is okay.'
"This 'string' is okay."
"This ""string"" is okay."
```

These strings are illegal:

```
'This 'string' is not okay.'
"This "string" is not okay."
```

DEBUG uses the ASCII values of the characters in the string as a list of byte values, which means abc is the same as 61 62 63.

value

This is a hexadecimal value of up to 4 digits. Use this parameter to specify a port number or the number of times a command repeats its function.

DEBUG commands—The remainder of this section summarizes the DEBUG commands and their uses.

A (Assemble)

Assembles 8088 mnemonics into memory.

Format: A[*address*]

Use this command to assemble 8088 mnemonics directly into memory at *address*. Enter data as hexadecimal values after mnemonics on separate lines. You must be familiar with assembly language programming to use this command.

If DEBUG detects a format error, it points out the error and redisplays the current assembly address.

C (Compare)

Compares portions of memory.

Format: C *range address*

Use this command to compare the portion of memory you specify in *range* to another portion of the same size beginning at *address*. Nothing displays if the two areas of memory are identical; otherwise, the difference displays with the addresses bracketing the different bytes.

For example, both of these commands compare the block of memory from $100 to $1FF with the block of memory from $300 to $3FF:

```
C100, 1FF 300
C100L100 300
```

D (Dump)

Displays a portion of memory.

Format: D[*range*]

Use this command to display the contents of the region of memory you specify in *range*. If you omit *range*, DEBUG displays 128 bytes starting at the first address (DS:100) after the address displayed by the previous Dump command.

The Dump display contains two portions. Each byte is shown in hexadecimal on the left. The ASCII representation of the byte appears on the right and identifies nonprinting characters with a period. Each display line shows 16 bytes with a hyphen between the eighth and ninth bytes and begins on a 16-byte boundary.

An example of this display is shown below:

```
-d
0A63:0100  B9 2C 00 BE 20 00 8A 14-B4 02 CD 21 46 E2 F7 CD 9,.>...4.MIFbwM
0A63:0110  20 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0A63:0120  54 68 69 73 20 69 73 20-61 20 74 65 73 74 20 66 This is a test f
0A63:0130  69 6C 65 20 66 6F 72 20-75 73 65 20 77 69 74 68 ile for use with
0A63:0140  20 44 45 42 55 47 2E 0D-0A 0A 0A 07 00 00 00 00  DEBUG.........
0A63:0150  20 20 74 68 65 20 20 66-69 6C 65 00 00 73 70 65   the file..spe
0A63:0160  63 69 66 69 63 61 74 69-6F 6E 20 20 77 69 6C 6C cification will
0A63:0170  20 6E 65 65 64 20 74 6F-20 62 65 20 63 68 61 6E  need to be chan
```

E (Enter)

Enters a value into memory.

Format: E *address* [*list*]

Use this command to enter byte values into memory at the address you specify. The values in *list* replace the contents of one or more bytes beginning at *address*; in the event of an error, no byte values change.

If you omit *list*, DEBUG displays the specified address and its contents. It then repeats the address on the next line and waits for your input. You can respond in one of the following ways:

- Replace the value of this address by typing a new value.
- Advance to the next byte by pressing the space bar.
- Return to the preceding byte by typing a hyphen (–).
- Terminate the command by pressing Enter.

For example, the command E 1ØØ Ø1 Ø2 changes the byte at location 100 to 01 and the byte at location 101 to 02.

F (Fill)

Enters values into memory.

Format: F *range list*

Use this command to fill the addresses in the *range* with the values in the *list*. For example, if you type the following command:

```
FØ4BA:1ØØ L 1ØØ 42 45 52 54 41
```

DEBUG fills memory locations from 04BA:100 to 04BA:1FF with the values in the *list* until all bytes are filled.

G (Go)

Allows you to execute a program at an address you specify.

Format: G[=*address1* [*address...*]]

Use this command to execute the program currently in memory at *address1*. If you don't specify the optional address parameters, the program executes normally.

Use the =*address1* parameter to run the program from a particular address. Use the other optional addresses to set breakpoints.

H (Hex)

Displays the sum and difference of two hexadecimal values.

Format: H *value value*

Use this command to display the sum and difference of the two values. First, DEBUG adds the two parameters; then it subtracts the second parameter from the first. The results display on one line: first the sum, then the difference. For example, type H19F 1ØA. DEBUG performs the calculations and displays the results:

```
Ø2A9 ØØ95
```

I (Input)

Displays a value.

Format: I *value*

Use this command to input and display one byte from the port you specify in *value*. You can specify a 16-bit port address.

L (Load)

Loads a file into memory.

Format: L[*address* [*drive record number*]]

Use this command to load a file into memory. After the file loads, the BX:CX registers contain the number of bytes read. You must name the file with the N command. DEBUG formats a filename in a file control block at CS:5C.

If you type the L command without any parameters, DEBUG loads the file specified by the N command into memory beginning at address CS:100 and sets the BX:CX registers to the number of bytes read. If you type the L command and include an *address* parameter, loading begins at the memory address you specify.

If you type all the parameters, absolute logical disk sectors load, not a file. The records are taken from the *drive* you specify. DEBUG begins loading with the first *record* and continues until the number of sectors you specify in the *number* parameter load.

For example, to load the file TEST1.COM after DEBUG loads, type the following commands:

```
-NTEST1.COM
-L
```

The N command names the file to load and then the L command carries out the actual loading process.

To load the boot sector of a diskette in drive A at address CS:100, type the following command:

```
-L,100,0,0,1
```

M (Move)

Moves a block of memory to a new location.

Format: `M range address`

Use this command to move the block of memory from *range* to the location beginning at the *address*. This command copies data from one area into another and writes over the new addresses.

However, this command first moves addresses that could be overwritten. Overlapping moves (that is, where part of the block overlaps some of the current addresses) always occur without loss of data.

Moves from higher addresses to lower addresses begin at the block's lowest address and work toward the highest. Moves from lower addresses to higher addresses begin at the block's highest address and work toward the lowest. If the addresses in the block being moved will not have new data written to them, the original data remains.

For example, type `MCS:100 110 CS:500`. DEBUG first moves address CS:110 to address CS:510, then CS:10F to CS:50F, and so on until CS:100 moves to CS:500. Use the D command to see the results of the move: `D CS:500`.

N (Name)

Assigns new filenames.

Format: `N filename [filename...]`

Use this command to set filenames to perform two functions:

- You can use the Name command to assign a *filename* for a later Load or Write command. Thus, if you start DEBUG without naming a file, then you must use the N command before you can load a file.
- You can use the Name command to assign *filename* parameters to the file that DEBUG is going to affect. For example, you can specify a set of data files that you want a program file to use.

These two functions may overlap. For example, the following set of DEBUG commands name, load, and then execute the file FILE1.EXE.

```
-NFILE1.EXE
-L
-G
```

If the file requires that you add some data files as parameters, you can use the Name command in the form:

```
-NFILE1.EXE ONE.DAT TWO.DAT
-L
-G
```

You can also specify these data files using the N command after loading FILE1.EXE:

```
-NFILE1.EXE
-L
-NONE.DAT TWO.DAT
-G
```

Although the Go command causes FILE1.EXE to execute as if you typed ONE.DAT and TWO.DAT at the MS-DOS command level, this can cause problems if you enter a Write command. If you execute a Write command at this point, it saves FILE1.EXE—the file you intend to debug—with the name ONE.DAT. To avoid this result, always execute a Name command before either a Load or a Write command.

O (Output)

Outputs a value.

Format: O *value byte*

Use this command to send the *byte* you specify to the output port you identify in *value*. A 16-bit port address is allowed.

P (Proceed)

Traces a program.

Format: P

Use this command to trace a program while it executes so you can see the contents of all registers and flags next to the decoded instruction. Interrupts, subroutine calls, repeat-string instructions, and loop instructions are treated as a single operation. (To trace individual steps, use the Trace command.) Control is returned to the instruction immediately after the called routine. This is extremely useful in tracing across system calls and procedures.

Q (Quit)

Exits DEBUG.

Format: Q

Use this command, which has no parameters, to exit DEBUG and return to the command level without saving the file currently in operation.

R (Register)

Displays or alters the contents of CPU registers.

Format: R [*register-name*]

Use this command to display the contents of one or more CPU registers. If you do not type a *register-name*, the R command dumps the register save area and displays the contents of all registers and flags.

If you type a *register-name*, the 16-bit value of that register appears in hex and a colon appears as a prompt. You can type a value to change the register, or press **Enter** to leave the register unchanged.

The only valid register names are the following:

AX	DX	SI	ES	IP
BX	SP	DI	SS	PC
CX	BP	DS	CS	F

IP and PC both refer to the Instruction Pointer.

Any other entry for *register-name* results in a BR Error (bad register).

If you enter F as the *register-name*, DEBUG displays each flag with a two-character alphabetic code. To alter any flag, type the opposite two-letter code. You can either set or clear the flags.

The flags and their codes for SET and CLEAR are:

Flag name	*Set*	*Clear*
Overflow	OV	NV
Direction	DN Decrement	UP Increment
Interrupt	EI Enabled	DI Disabled
Sign	NG Negative	PL Plus
Zero	ZR	NZ
Auxiliary Carry	AC	NA
Parity	PE Even	PO Odd
Carry	CY	NC

S (Search)

Searches for a value.

Format: S *range list*

Use this command to search the *range* for the *list* of bytes. The *list* may contain one or more bytes, (separate each one with a space or comma). If the *list* contains more than one byte, only the address of the first byte is returned.

For example, if you type SCS:100 110 41, DEBUG displays a response similar to this:

```
04BA:0104
04BA:010D
```

T (Trace)

Traces a program.

Format: T [=*address*] [*value*]

Use this command to trace a program while it executes so you can see the contents of all registers and flags next to the decoded instruction. The optional =*address* parameter starts tracing at *address*. The optional *value* parameter sets the number of steps you want to trace. If you don't specify a *value*, one step is traced.

The T command uses the trap flag of the 8088 microprocessor, which means you may also trace instructions stored in ROM.

U (Unassemble)

Converts memory into assembly language mnemonics.

Format: `U [range]`

Use this command to convert the bytes in memory to the corresponding source statements, showing addresses, byte values, and mnemonics. You must be familiar with assembly language mnemonics to understand the output from this command.

W (Write)

Writes a file.

Format: `W [address [drive record number]]`

Use this command to write the debugged file to a disk file. If you use the W command without parameters, BX:CX must already be set to the number of bytes to be written; the file begins writing from CS:100. If you use the W command with just an *address*, then the file begins writing at that address. If you use a G or T command, BX:CX must be reset before using the Write command without parameters. Note that if a file is loaded and modified, the name, length, and starting address are all set correctly to save the modified file (as long as the length has not changed).

You must name the file to be written either when loading DEBUG or with the N command. In both cases, DEBUG lists the filename in a file control block at CS:5C.

If you type the W command with parameters, the write begins from the memory *address* and to the *drive* you specify. DEBUG writes the file beginning at the logical record number specified by *record*, and continues to write the file until the number of sectors specified in the *number* parameter have been written.

Warning
Writing to absolute sectors is extremely dangerous. This process bypasses the file management portion of MS-DOS.

Example
The following example shows how you can use DEBUG to load and alter a file and then re-save it on disk. This procedure is commonly called patching a file. This example makes use of a sample file, TESTBUG.COM, included on one of your MS-DOS disks. To try the examples in this section, copy DEBUG.COM and TESTBUG.COM onto a working disk. Do not write-protect this disk because the examples include the command to write the altered file to the disk.

Follow these steps to alter a file using DEBUG:

1. Start DEBUG by typing DEBUG and pressing Enter.
2. Name the file to be examined or altered with the Name command.
3. Load the file with the Load command.
4. Examine the file in memory with the Dump and Unassemble commands.
5. Alter the file with the Edit, Fill, and Assemble commands.
6. Test the program by running parts of it under the control of the Go command.
7. If necessary, rename the file with the Name command.
8. Put the file back on to the disk with the Write command.

Preparing to alter the file—Before altering the sample file, run it to see what it does. At the command prompt, type TESTBUG and press **Enter**. A message prints, the cursor moves down three lines, and the computer beeps.

Now start DEBUG. To load TESTBUG.COM at the same time as DEBUG, type DEBUG TESTBUG.COM and press **Enter**.

Examining the file—TESTBUG.COM is a short file, 50H bytes long. DEBUG always loads the file you specify starting at 100H in the current segment. To display the area of memory containing the file, type D 100 L50 and press **Enter**. You see the following:

```
0A63:0100  B9 2C 00 BE 20 01 0A 14-B4 02 CD 21 46 E2 F7 CD 9,.>...4.M!FbwM
0A63:0110  20 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0A63:0120  54 68 69 73 20 69 73 20-61 20 74 65 73 74 20 66 This is a test f
0A63:0130  69 6C 65 20 66 6F 72 20-75 73 65 20 77 69 74 68 ile for use with
0A63:0140  20 44 45 42 55 47 2E 0D-0A 0A 0A 07 00 00 00 00 DEBUG...........
```

The first parameter tells DEBUG where to start the dump. The parameter following the L is the number of bytes to display. The first two lines of the display consist of the program to print the message and do not mean anything in this form. The message itself starts on the third line; you can read it in the block at the right of the screen.

The memory address (in these examples, 0A63) varies depending on where MS-DOS loads DEBUG into memory.

To display the program in a more readable form, use the Unassemble command. Type U 100 14F and press **Enter**. You see the program scroll by on your screen in the following format:

```
0A63:0146  2E          CS:
0A63:0147  0D0A0A      OR      AX,0A0A
0A63:014A  0A07        OR      AL,[BX]
0A63:014C  0000        ADD     [BX+SI],AL
0A63:014E  0000        ADD     [BX+SI],AL
```

This time the second parameter is the address where DEBUG stops unassembling. With most commands like this, you can use either method to tell DEBUG how much of the file to process. The program displays using assembly language mnemonics. Where the program ends (after the eighth line), the unassembled codes stop making sense. To see just the working part of the program, type U 1ØØ L1Ø and press **Enter**.

The other thing you often need to display when you are using DEBUG is the condition of the registers and flags of the CPU. The Register command lets you display and alter the register contents. To see the contents of all the registers and flags, type R and press **Enter**. You see:

```
AX=0000  BX=0000  CX=0256  DX=0000  SP=FFFE  BP=0000  SI=0000  DI=0000
DS=0A63  ES=0A63  SS=0A63  CS=0A63  IP=0100   NV UP EI PL NZ NA PO NC
0A63:0100  B92C00          MOV          C,X002C
```

The most important registers are CX and BX in the top row, and IP in the second row. When you save a file, CX and BX tell DEBUG how much to save. The IP register indicates where DEBUG looks for the next instruction to execute. The DS, ES, SS, and CS registers vary depending on where in memory DEBUG loads. The assembly language mnemonics on the last line are the instructions to which the IP register is currently pointing.

Running the program—The last instruction in the display produced by the U command starts at 10FH. Because the IP register currently points to the start of the program at 100H, you can run it using the Go command by typing G 1Ø0F and pressing Enter. After the message is printed, you see the registers again:

```
AX=0000  BX=0000  CX=0000  DX=0007  SP=FFFE  BP=0000  SI=014C  DI=0000
DS=0A63  ES=0A63  SS=0A63  CS=0A63  IP=0100   NV UP EI PL NZ NA PO NC
0A63:010F CD20       INT        20
```

Now you can see that DX contains the value 7, the character that made the beep, and SI contains 14C, the address of the character after the beep. Similarly, IP is now 10F, the address of the next instruction to be performed. To reset the IP register ready to run it again, type RIP and press Enter; then type 1Ø0 and press Enter.

Altering the program—To alter the program to display a shorter message, followed by just a carriage return and a line feed, you need to change the program by putting in the new message, editing in the carriage return and line-feed codes, and changing the byte containing the length of the message. (If you look at the dump from the Dump command, this is located at address 101H.) To change the message to *This is a test message*, you must alter bytes starting at 12FH. To edit text in this way, put it in single quotes. Type E 12F 'message' and press Enter.

If you dump the program again with the D command, you see the altered message. The byte following the end of the new message is at location 137H. To put in the carriage return and line feed codes, type E 136 and press Enter. DEBUG responds with:

```
0A63:0136 72.
```

The byte displayed is the current value stored; 72H is the code for an r. Type the new value, ØD (carriage return), and press the spacebar to display the next byte. Type ØA (line feed), then press **Enter**. The screen shows the following:

```
ØA63:Ø136 72.ØD 20.ØA
```

The total length of the message is now 18H, so you can delete the rest of the message by typing E 1Ø1 and pressing **Enter**. Type 18 and press **Enter**.

You can now try the program using the Go command. (Reset the IP register afterwards as described above.)

Another useful command for changing the program is the Fill command. Use this command to fill an area of memory with a particular byte or pattern of characters. The following two commands overwrite the new message with the letter A (character code 41H) and the pattern az. They also show the two ways of giving the range to fill. Press **Enter** after each command. Use the D command after each fill to examine the results.

```
-F 12Ø 135 41
-F 12Ø L16 'az'
```

Writing the file to disk—When you finish correcting the program, reset the IP register to the beginning of the program using the R command. Then set the CX register to tell DEBUG how many bytes to save. The program is still 50H bytes long, so type R CX and press **Enter**. You see CX ØØØØ. Type 5Ø and press **Enter**.

Use the R command alone to check that the registers are set correctly, including the BX register, which must contain 0.

If you want to give the altered program a new name, use the Name command. You can save the file by typing W and pressing **Enter**. You see the following message:

```
Writing ØØ5Ø bytes
```

To leave DEBUG, type Q and press **Enter**.

EDLIN

External

Purpose

Creates and edits text files for your system.

Format

`[d:][path]EDLIN [d:][path]filename [/B]`

Description

The EDLIN utility is a line editing program that comes complete with its own subcommands. You can use EDLIN to create, change, and display files, whether they are source programs like a BASIC program or text files you create using a word processor.

EDLIN is useful only when you want to edit files that are in ASCII format. This is true of some word-processing and GW-BASIC files. EDLIN is of limited use with other types of files.

Use the /B switch when editing files that may have end-of-file characters in the text. The /B switch tells EDLIN to ignore Ctrl Z (1AH).

You can use EDLIN to perform the following functions:

- Create new source files and save them (you can even create a BASIC program with EDLIN)
- Update existing files and save both the updated and original files
- Delete, edit, insert, and display lines or characters
- Search for, delete, or replace text within one or more lines.

When you create or edit text in files, EDLIN divides the text into lines. Each line can contain as many as 253 characters. EDLIN displays line numbers during the editing process but does not actually record them in the file. EDLIN automatically renumbers lines in the file when you insert or delete text.

Starting EDLIN—To create a new file, type EDLIN followed by the name of the file you wish to create. The following message and prompt appear:

```
New file
*
```

Notice that the EDLIN prompt is an asterisk (*).

You can now type lines of text into the file. To begin entering text, use the I command to insert lines. (The I command is explained later in this chapter.)

To edit an existing file, type EDLIN and the name of the file you want to edit. EDLIN loads the file into memory and displays this message on your screen:

```
End of input file
*
```

You can then edit the file using the EDLIN commands.

If the file is too large to be loaded into memory, EDLIN loads lines of the file until memory is three-quarters full; then it displays the * prompt. You can then edit the portion of the file in memory.

To edit the remainder of the file, you must first save the edited lines. EDLIN then loads the unedited lines from disk into memory. Use the Write and Append commands for this procedure.

When you complete the editing session, you can save the original and the updated (new) file to disk using the End command. The original filename now includes a .BAK extension, and the new file has the filename and extension you originally specified with the EDLIN command. Do not erase any previous .BAK files until the end of the editing session or until you require extra disk space.

Warning
Do not try to edit a file with an extension of .BAK because EDLIN assumes that any .BAK file is a backup file. If you find it necessary to edit such a file, rename the file with another extension (using the MS-DOS RENAME command), then start EDLIN and specify the new filename.

When editing a new file or an existing one with EDLIN, remember that it is acceptable to use path names along with the filename. For example, typing `EDLIN \WORDPROC\PERSONAL\RESUME.TXT` allows you to edit RESUME.TXT in the subdirectory PERSONAL.

Command information—Table 8-2 provides a summary of the EDLIN commands.

Table 8-2. EDLIN commands

Command	Function
line	Edits line number
A	Appends lines
C	Copies lines
D	Deletes lines
E	Ends editing; saves all changes
I	Inserts lines
L	Lists lines
M	Moves lines
P	Inserts page breaks
Q	Quits editing; does not save changes
R	Replaces lines
S	Searches text
T	Transfers text
W	Writes lines

Several EDLIN commands accept one or more options. The effect of an option varies, depending on the command you are using. The command options are shown on the following page.

line

This option indicates a line number that you type. You can enter a comma or a space to separate line numbers from other line numbers, other options, and from the command.

You can specify *line* in one of four ways:

- Type any whole number less than 65534. If you specify a number greater than the largest existing line number, then EDLIN assumes you mean the line after the last existing line number.
- Type a period (.) to indicate the current line number. The current line is the last line edited. An asterisk (*) between the line number and the first character appears on your screen to mark the current line.
- Type a pound sign (#) to indicate the line after the last line number in the file. This has the same effect as specifying a number larger than the last line number in the file.
- Press **Enter** without any line specifiers to direct EDLIN to use the default value for the command.

?

The question mark option directs EDLIN to ask if a correct string has been found when using the Search and Replace commands. Before continuing, EDLIN waits for you to enter either a Y or **Enter** for a Yes response, or any other key for a No response.

string

The string option represents text you want to find or replace, or the replacement text. Use the string option only with the Search and Replace commands. You must press **Ctrl Z** or **Enter** to end each string. Do not leave spaces between strings or between a string and its command letter, unless you want to include those spaces as part of the string.

Special editing features—There are several special features that enhance the EDLIN editing commands:

- You can reference line numbers relative to the current line. Use a minus sign (−) with a number to indicate lines before the current line. Use a plus sign (+) with a number to indicate lines after the current line. For example, the command `-1Ø,+1ØL` lists 10 lines before the current line, the current line, and 10 lines after the current line.

- You can issue multiple commands on one command line. When issuing a command to edit a single line using a line number, you must use a semicolon to separate commands on the line. Otherwise, one command may follow another without any special separators. In the case of a Search or Replace command, you can end the string by a **Ctrl Z** instead of **Enter**. For example, the command line `15;-5,+5L` edits line 15 and then displays lines 10 through 20 on the screen.

  To search for *This string* and then display 5 lines before and 5 lines after the line containing the matched string, type `STh is string` and press **Ctrl Z**; then type `-5,+5L`.

- You can type EDLIN commands with or without a space between the line number and command. For example, to delete line 6, the command `6D` is the same as `6 D`.

- Press **Ctrl V** while in the insert mode to insert control characters into text. **Ctrl V** indicates that the next uppercase letter you type is a control character. You can also use a control character in any of the string arguments of Search and Replace. For example, to find the first occurrence of Ctrl Z, type S, press **Ctrl V**, and type Z.

  To replace all occurrences of Ctrl Z in a file with the End command, type R, press **Ctrl V**, type Z, press **Ctrl Z**, and type End.

  To insert a **Ctrl V** into the text, press **Ctrl V** and type V.

- Ctrl Z normally indicates end-of-file. If you use Ctrl Z characters elsewhere in a file, it is necessary to tell EDLIN that these do not mean end-of-file. This is done by using the optional /B switch when entering EDLIN. In this way, EDLIN ignores all Ctrl Z characters and shows the entire file.

EDLIN also makes use of the special editing keys. See Chapter 1 for a complete description of how to use these keys for editing.

EDLIN commands—This section provides an alphabetical list of all EDLIN commands and examples of how to use them.

A (Append)

Adds data to a file.

Format: `[n]A`

Use this command to append, or add, a specific number of lines (*n*) from disk to the file you are editing in memory. EDLIN adds these lines at the end of the lines currently in memory.

This command is meaningful only if the file you are editing is too large to fit into memory.

To edit the remainder of the file that does not fit into memory, you must write the lines that you have already edited to disk. After this is done, you can load unedited lines from disk into memory with the Append command. Refer to the Write command in this section for information on how to write edited lines to disk.

If you do not specify the number of lines to append, EDLIN appends lines until available memory is three-quarters full. No action is taken if available memory is already three-quarters full. Once the last line of the file is read, you see the message `End of input file`.

Examples: After you save edited lines to disk with the Write command, type `2ØA` at the * prompt to append the next 20 lines to memory.

C (Copy)

Copies lines of text.

Format: `[begline][,endline,]line[,count]C`

Use this command to copy a range of lines (*begline* to *endline*) to a specific *line* number. You can copy the lines as many times as you like by using the *count* option.

If you do not specify *count*, EDLIN copies the lines once. If you omit *begline* or *endline*, the current line is the default. After the copy, the file is renumbered automatically.

If the line numbers overlap, the message `Entry error` displays. For example, typing `3,2Ø,15C` produces this error message.

If you want to place text within other text, specify the line before the line where you want the copied text to appear. In other words, the copied text is inserted after the line you specify.

Examples: Assume that the following file exists and is ready for you to edit:

```
1: This is a sample file
2: used to show copying lines.
3: See what happens when you use
4: the (C)opy command
5: to copy text in the file
```

Type `1,5,6C` to copy this entire block of text. The result is:

```
 1: This is a sample file
 2: used to show copying lines.
 3: See what happens when you use
 4: the (C)opy command
 5: to copy text in the file
 6: This is a sample file
 7: used to show copying lines.
 8: See what happens when you use
 9: the (C)opy command
10: to copy text in the file
```

Type `1,5,6,2C` to make two copies of the lines.

D (Delete)

Deletes lines of text.

Format: [*begline*][,*endline*]D

Use this command to delete a range of lines from a file.

If you omit *begline*, it defaults to the current line (the line with the asterisk). To delete *begline* only, omit *endline*. After the deletion, the line immediately following the deleted section becomes the current line with the same line number as the original *begline*.

Examples: Assume that the following file exists and is ready for you to edit:

```
    1: This is a sample file
    2: used to show dynamic line numbers
    3: See what happens when you use
    4: Delete and Insert
     .
     .
     .
   25: (the D and I commands)
   26: to edit the text
   27:*in your file
```

Type 5,24D to delete lines 5 through 24. The result is the following:

```
    1: This is a sample file
    2: used to show dynamic line numbers
    3: See what happens when you use
    4: Delete and Insert
    5: (the D and I commands)
    6: to edit the text
    7:*in your file
```

Type 6D to delete this single line. The result is the following:

```
1: This is a sample file
2: used to show dynamic line numbers
3: See what happens when you use
4: Delete and Insert
5: (the D and I commands)
6:*in your file
```

Next, to change the current line to 3, type 3 at the asterisk and then press **Enter**. Press **Enter** again to the EDLIN prompt.

Type ,6D to delete the lines from the current line, which is now 3, to line 6. The result is the following:

```
1: This is a sample file
2: used to show dynamic line numbers
3:*in your file
```

Notice that the lines are automatically renumbered.

E (End)

Exits EDLIN.

Format: E

Use this command to save the edited file on disk, rename the original input file to filename .BAK, and then exit EDLIN. If you originated this file during the editing session, EDLIN does not create a .BAK file.

The E command has no options. Therefore, you cannot indicate the drive where you want to save the file using the E command. You must select the drive where you want to save the file when you start the editing session. If you did not specify a drive, then EDLIN saves the file on the default drive. You can copy the file to a different drive using the MS-DOS COPY command.

You must be sure that the disk contains enough free space for the entire file. If the disk does not contain enough free space, the disk writing process aborts and parts of the edited file are lost.

After executing the E command, the MS-DOS prompt is displayed. You can use the MS-DOS DIR command to check the status of the saved file.

I (Insert)

Inserts text.

Format: [*line*]I

Use this command to insert text immediately before the specified *line*. If you do not specify *line*, new lines are inserted before the current line. If *line* is any number larger than the last line number, or if you use a pound sign (#) to specify line, the inserted lines append to the end of the file. In this case, the last inserted line becomes the current line.

If you are creating a new file, you must enter the I command before you can type (insert) text. Text begins with line number 1 and successive line numbers appear automatically each time you press **Enter**.

EDLIN remains in insert mode until you press **Ctrl C**. After the insert is complete and you exit insert mode, the line immediately following the inserted lines becomes the current line. All line numbers following the inserted section are incremented by the number of inserted lines.

Examples: Assume that the following file exists and is ready for you to edit:

```
1: This is a sample file
2: used to show dynamic line numbers.
3: See what happens when you use
4: Delete and Insert
5: to exit text
6: and remember lines
7:*in your file
```

Type 5I to insert text before a specific line (in this case, line 5) that is not the current line.

EDLIN displays a blank line with the number 5 and an asterisk, and waits for you to insert text.

Now, type (`the D and I commands`) as the text for line 5. When line number 6 appears, press **Ctrl C** to end the insertion.

Type L to list the entire file. You see the following:

```
1: This is a sample file
2: used to show dynamic line numbers.
3: See what happens when you use
4: Delete and Insert
5: (the D and I commands)
6:*to edit text
7: and renumber lines
8: in your file
```

Type I only to insert text immediately before the current line.

To exit insert mode, press **Ctrl C** once again.

You can type `#I` or `2Ø I` to append new lines to the end of the sample file.

Both formats tell EDLIN to start appending after the last line. In the second case, 20 is larger than the last line number that exists in the file, so EDLIN starts appending after the last line number.

L (List)

Displays text.

Format: [*begline*][,*endline*]L

Use this command to list, or display, a range of lines including the two lines you specify. If you omit either *begline* or *endline*, EDLIN uses default values.

If you omit *begline*, the display starts 11 lines before the current line and ends with *endline*. You must enter the beginning comma to indicate the default option:

```
,endlineL
```

If you omit *endline* the screen displays 23 lines starting with *begline*:

```
beglineL
```

If you omit both parameters, 23 lines are displayed. These include the 11 lines before the current line, the current line, and the 11 lines after. If there are fewer than 11 lines before the current line, more than 11 lines after the current line are displayed to make a total of 23.

Examples: Assume that the following file exists and is ready for you to edit:

```
 1: This is a sample file
 2: used to show dynamic line numbers
 3: See what happens when you use
 4: Delete and Insert
 5: (the D and I commands)
  .
  .
  .
15:*The current line contains an asterisk.
  .
  .
  .
26: to edit text
27: in your file.
```

Type `2,5L` to list a range of lines without reference to the current line. The result is the following:

```
 2: used to show dynamic line numbers
 3: See what happens when you use
 4: Delete and Insert
 5: (the D and I commands)
```

Type ,26L to list a range of lines beginning with the current line. The result is the following:

```
15:*The current line contains an asterisk.
  .
  .
  .
26: to edit text
```

Type L to list a range of text centered around the current line.

M (Move)

Moves text to a new location.

Format: [*begline*][,*endline*,]*line*M

Use this command to move a block of text to another location in the file. The lines renumber according to the direction of the move. If the line numbers overlap, EDLIN displays the message `Entry error`.

Examples: Type ,+25,1ØØM to move text from the current line plus 25 lines to line 100. Type 2Ø,3Ø,1ØØM to move lines 20 through 30 to line 100.

P (Page)

Pages through text.

Format: [*begline*][,*endline*]P

Use this command to page through a file 23 lines at a time. If you omit *begline*, that number defaults to the current line plus 1. If you omit *endline*, the 23 lines following *begline* display. The new current line becomes the last line displayed.

Examples: Type P to display the 23 lines following the current line.

Type 5P to display the 23 lines following line 5.

Q (Quit)

Ends EDLIN.

Format: Q

Use this command to quit the editing session without saving any editing changes you have made. You exit EDLIN, and the default drive prompt appears.

Because using this command has drastic effects, EDLIN prompts you to make sure that you don't want to save the changes. Press **Y** if you want to quit the editing session. Press **N** or any other character (except Y) if you want to continue the editing session.

Warning

When you start this command, EDLIN erases the .BAK file associated with the specified filename. If you reply **Y** to the abort message, the previous .BAK file no longer exists.

Remember to use the E command to make permanent changes to the file.

Examples: To quit the editing session, type Q and press **Enter**.

You see the message:

```
Abort edit (Y/N)?
```

Type **Y** and then press **Enter** to abort the file.

R (Replace)

Replaces text.

Format: `[`*`begline`*`][,`*`endline`*`][?]`*`Rstring1`*Ctrl Z*`string2`*

Use this command to replace all occurrences of a string of text in the specified range with a different string of text or blanks. After you type `Rstring1`, press **Ctrl Z** and then type `string2`.

EDLIN finds each occurrence of *string1* and replaces it with *string2*. EDLIN displays each line in which a replacement occurs. If a line contains two or more replacements of *string1* with *string2*, the line is displayed once for each occurrence. When EDLIN replaces all occurrences of *string1* with *string2*, the R command terminates and the asterisk prompt is displayed.

When you give a second string as a replacement, you must separate *string1* from *string2* with a **Ctrl Z**. You must also end *string2* with a **Ctrl Z** and **Enter** combination or with a single **Enter**.

If you omit *string1*, Replace takes the old *string1* as its value. If there isn't a prior *string1*, the replacement process terminates immediately. If you omit *string2*, you can press **Enter** to end *string1*.

If you omit *begline* in the range argument, then *begline* defaults to the line after the current line. If you omit *endline*, # is the default. This is the same as *begline*,#. Remember, # indicates the line after the last line of the file.

If you end *string1* with **Ctrl Z** and there is no *string2*, an empty string becomes the new replace string. For example, type `Rstring2` and press **Ctrl Z** and **Enter** to delete occurrences of *string1*. But if you type `Rstring1` and press **Enter** and then type R and press **Enter**, EDLIN replaces *string1* with the old *string2*, and the old *string1* with the old *string2*, respectively. Note that old refers to a string previously specified in a Search and Replace command.

If you use the question mark (*?*) option, the Replace command stops at each line with a string that matches *string1*, displays the line with *string2* in place, and then displays `O.K.?` as the prompt.

If you press **Y** or **Enter**, then *string2* replaces *string1*, and EDLIN finds the next occurrence of *string1*. Again, the `O.K.?` prompt displays. This process continues until the end of the range or until the end of the file. After finding the last occurrence of *string1*, EDLIN displays the asterisk prompt.

If you press any key other than Y or **Enter** after the `O.K.?` prompt, *string1* does not change and Replace goes to the next occurrence of *string1* (even if *string1* occurs more than once in a line). EDLIN replaces each occurrence of *string1* individually and the `O.K.?` prompt displays before each replacement. In this way, you can select each *string1* replacement, and prevent unwanted substitutions.

Examples: Assume that the following file exists and is ready for you to edit:

```
 1:*This is a sample file
 2: used to show dynamic line numbers
 3: See what happens when you use
 4: Delete and Insert
 5: (the D and I commands)
 6: to edit text
 7: in your file.
 8: The insert command can place new lines
 9: in the file; there's no problem
10: because the line numbers are dynamic;
11: they'll go all the way to 65533.
```

To replace all occurrences of *and* with *or* in a specified range, type `2,12Rand` and press **Ctrl Z**. Then type `or` and press **Enter**. The result is the following:

```
 4: Delete or Insert
 5: (the D or I commands)
 5:*(the D or I commors)
 8: the insert commor can place new lines
```

Perhaps there are some unwanted substitutions. To avoid these and to confirm each replacement, you can use the same original file with a slightly different command.

In the next example, only certain occurrences of *and* with *or* can be made. To force the O.K.? prompt, type `2,12?Rand` and press Ctrl Z. Then type `or` and press Enter. The result is:

```
4: Delete or Insert
O.K.? Y
5: (The D or I commands)
O.K.? Y
5: (The D or I commors)
O.K.? N
8: The insert commor can place new lines
O.K.? N
*
```

Now, type the List command (L) to see the result of all these changes. You should see the unchanged lines and the new ones.

S (Search)

Searches for a string of text.

Format: [*begline*][,*endline*][?]S*string*

Use this command to search the specified range of lines for the specified string of text. You must press Enter to end the string.

The first line that matches *string* displays and becomes the current line. If you do not specify the question mark option, the Search command terminates when it finds a match. If it cannot find a match, you see the message `Not found`.

If you include the question mark option (?) in the command, EDLIN displays the first line with a matching string and the `O.K.?` prompt is displayed.

If you press either Y or Enter, the line becomes the current line and the search terminates. If you press any other key, the search continues.

If you omit *begline*, it defaults to the line after the current line. If you omit *endline*, it defaults to # (the line after last line of the file), which is the same as *begline*,#S*string*. If you omit *string*, Search takes the old string if there is one. (Note that old refers to a string specified in a previous Search or Replace command.) If an old string does not exist, the command terminates immediately.

Examples: Assume that the following file exists and is ready for you to edit:

```
 1: This is a sample file
 2: used to show dynamic line numbers
 3: See what happens when you use
 4: Delete and Insert
 5: (the D and I commands)
 6: to edit text
 7: in your file.
 8: The insert command can place new lines
 9: in the file; there's no problem
1Ø: because the line numbers are dynamic;
11: they'Il go all the way to 65533.
```

To search for the first occurrence of the string *and* between lines 2 and 12 inclusive, type `2,12Sand` and press **Enter**. The following line appears:

```
4: Delete and Insert
```

To find the next *and* type `,12Sand` and press **Enter**. The search then continues from the line after the current line (line 4), because you did not specify the first line. The result is the following:

```
5: (the D and I commands)
```

To search for several occurrences of the string *and*, type `1?Sand` and press **Enter**. The result is:

```
4: Delete and Insert

O.K.?
```

If you press any key (except **Y** or **Enter**), the search continues, so press **N** here. You see the following:

```
5: (the D and I commands)
O.K.?
```

Now press **Y** to terminate the search. You see the EDLIN * prompt.

To search for string XYZ without the verification (O.K.?), type SXYZ. EDLIN reports a match and continues to search for the same string when you type the S command with no options. This is because *string* defaults to any string previously specified in a Replace or Search command.

T (Transfer)

Moves text into the current file.

Format: [*line*]T*filename*

Use this command to insert, or merge, the contents of *filename* into the file you are currently editing at the *line* you specify. If you omit *line*, EDLIN uses the current line.

This command is useful if you want to place the contents of a file into another file or into the text you are typing. The text inserts at the line number you specify in *line* and the lines automatically renumber.

Examples: Type TNEW.TXT to insert text from a file called NEW.TXT at the current line.

Type 100TINS.DOC to insert the text from INS.DOC starting from line 100.

W (Write)

Writes text to disk.

Format: [*n*]W

Use this command to write a specific number of lines (*n*) to disk from the lines that you are editing in memory. EDLIN writes the lines to the disk beginning with line number 1.

This command is meaningful only if the file you are editing is too large to fit into memory. When you start EDLIN to edit a file, EDLIN reads lines from the file until memory is three-quarters full. To edit the remainder of your file, you must write edited lines in memory to disk. Then, use the Append command to load additional unedited lines from disk into memory.

If you do not specify *n*, EDLIN writes lines until one-quarter of memory is available. If available memory is already greater than one-quarter, no action is taken. All lines renumber, so that the first remaining line becomes line number 1.

Examples: Type `1ØØW` to save the first 100 lines of text to disk.

EXE2BIN

External

Purpose

Converts .EXE files to .BIN files.

Format

```
[d:][path] EXE2BIN [d:][path]filename
                   [d:][path][filename]
```

Description

Use this command only if you want to convert your executable (.EXE) files to binary format. This conversion saves disk space and provides faster program loading.

The first file you name is the input file. If you do not specify an extension, it defaults to .EXE.

If you do not specify a drive, this command uses the drive of the input file. If you do not specify an output filename, the command uses the input filename. If you do not specify a filename extension in the output filename, the new file takes the extension .BIN.

To execute the new .BIN file, you need to rename it with an extension of .COM.

The input file must be in a valid .EXE format as produced by the LINK command. The resident, or actual code, and data part of the file must be less than 64K. There must be no STACK segment.

Two kinds of conversions are possible, depending on whether or not the .EXE file contains a specified initial Code Segment and Instruction Pointer (CS:IP).

- If the .EXE file does not contain a specified CS:IP, a pure binary conversion takes place. If segment fixes are necessary (that is, the program contains instructions requiring segment relocation), prompts appear asking for the fixup value. This value is the absolute segment where the program is to load. The resulting program is usable only when loaded at the absolute memory address specified by a user application. If not, the command processor is not capable of properly loading the program.

- If you specify CS:IP as 0000:100H, this command runs the file as a .COM file with the location pointer set at 100H by the assembler statement ORG; the first 100H bytes of the file delete. You cannot provide segment fixups because .COM files must be segment relocatable. Once the conversion is complete, you may rename the resulting file with a .COM extension. Then, the command processor can load and execute the program in the same way as the .COM programs supplied on your MS-DOS system diskettes.

LINK

External

Purpose

Combines object code program modules.

Format

```
[d:][path]LINK [filename[,filename...]
               [/switch...]]

[d:][path]LINK @[d:][path]filename
```

Description

The MS-DOS LINK utility is a program that does the following:

- Combines separately produced object modules into one relocatable load module, which is a program you can run
- Searches library files for definitions of unresolved external references
- Resolves external cross-references
- Produces a listing that shows both the resolution of external references and error messages.

When you write a program, you write it in source code, either in a high-level programming language such as BASIC or in assembly language. If you use a high-level language, your source code passes through a compiler. If you use assembly language, the source code passes through an assembler. Both the compiler and the assembler produce object modules.

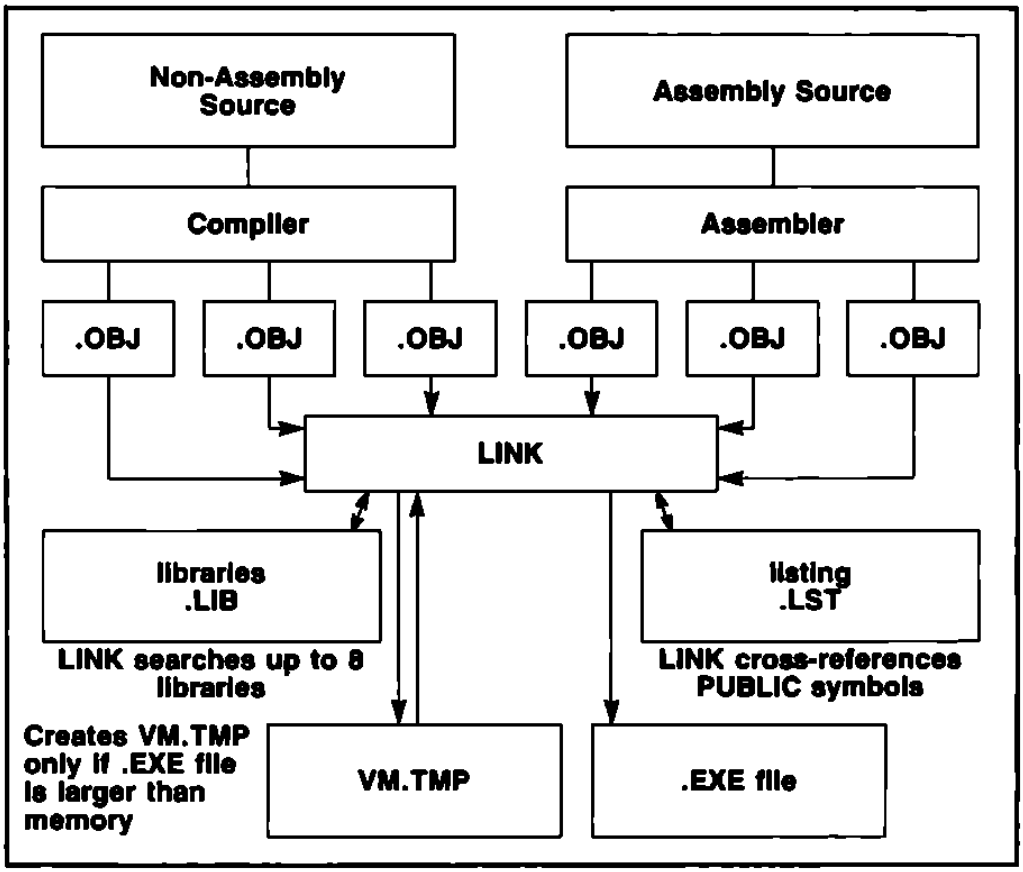
The object modules must then pass through a linking process to produce a language that the computer can understand directly. Machine language is the form your computer requires in order to run programs.

You may wish to link, or combine, several programs and run them together. LINK enables you to do this. LINK combines several object modules into one relocatable load module, which is then given the .EXE extension.

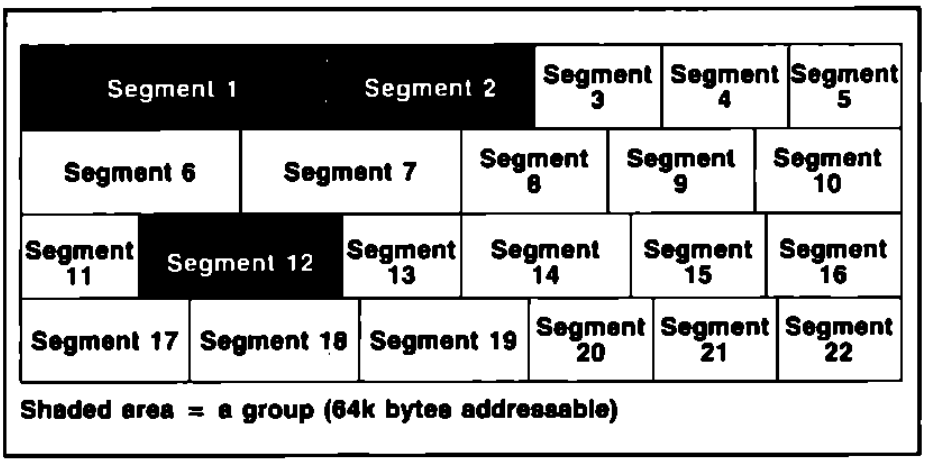
Your programs may contain symbols (called external references), which are defined in other object modules. As it combines modules, LINK makes sure that all external references between object modules are defined. LINK can search several library files for definitions of any external references that are not defined in the object modules. LINK produces a List file that shows resolved external references and also displays any error messages.

LINK uses available memory as much as possible. When no memory is available, LINK creates VM.TMP, which is a temporary disk file on the default drive.

The following figure illustrates the various parts of the LINK operation:



If you are writing and compiling programs in assembly language, you need to understand how this language divides memory into segments, classes, and groups. The following figure illustrates this division of memory.



In this illustration, the divisions may be:

	Segment Name	*Segment Class Name*
Segment 1	PROG.1	CODE
Segment 2	PROG.2	CODE
Segment 12	PROG.3	DATA

Segments 1, 2, and 12 have different segment names but may or may not have the same segment class name. Segments 1, 2, and 12 form a group.

Each segment has a name and a class name. LINK loads all segments into memory by class name from the first segment it encounters to the last. All segments with the same class load into memory contiguously.

A group is a collection of segments that fit within a 64KB area of memory. The segments do not need to be contiguous to form a group. The address of any group is the lowest address of the first segment in the group. LINK analyzes the groups and references the segments by their addresses in memory. A program may consist of one or more groups.

When you write assembly language programs, you can assign the group and class names in your program. In high-level languages, such as BASIC, COBOL, FORTRAN, and Pascal, the compiler names groups and classes automatically.

Files used by LINK—You can direct LINK to use general files. You can do the following:

- Work with one or more input file
- Produce one or two output files
- Create a temporary disk file
- Search up to eight library files.

You use the standard specification when specifying files in LINK. Be sure to include the drive and path if necessary.

If you don't specify a file extension for the input, or object file, LINK recognizes the following default extensions:

.OBJ	Object
.LIB	Library

LINK appends the following default extensions to the Run and List output files:

.EXE	Run
.MAP	List

You cannot change these extensions.

LINK uses available memory first. If your files create an output file that exceeds available memory, LINK creates a temporary file. It names this file VM.TMP and puts it on the disk in the default drive. If LINK creates VM.TMP, this message appears:

```
VM.TMP has been created.
Do not change disk in drive, d:
```

Once this message appears, you must not remove the disk from the default drive until the link session ends. If you do, the operation of LINK is unpredictable and LINK may display the following error message:

```
Unexpected end of file on VM.TMP
```

During the link process, LINK prompts you for the name of a Run file:

```
Run File:
```

LINK writes the contents of VM.TMP to this file. VM.TMP is a working file only and LINK deletes it at the end of the linking session. If you do not care to save the contents of VM.TMP, do not enter a filename for the Run File prompt.

Warning
Do not use VM.TMP as a filename for any file. If you do and LINK requires a temporary file, LINK deletes any existing VM.TMP file to create a new file.

Starting LINK—To start LINK; you must enter the LINK command and its parameters. You do this in one of three ways:

- You can type LINK only and then enter the parameters in response to individual prompts. Type LINK and press **Enter**.
- You can type the LINK command and all its parameters on the command line. Type LINK *filenames* [*/switches*] and press **Enter**.

  You can also further define this format as:

  ```
  LINK object-list,runfile,listfile,
       lib-list[/switch...]
  ```

  In this format, *object-list* is a list of object modules, which you separate with plus signs. *runfile* is the name of the file to receive the executable output. *listfile* is the name of the file to receive the listing. *lib-list* is a list of library modules you want to search. */switch* refers

to optional switches, which you can place following any of the response entries (just before any of the commas or after the lib-list, as shown).

To select the default for a parameter, simply type a second comma with no spaces between the two commas.

This format of the LINK command can easily fill up the command line. You can press **Ctrl J** to move the cursor to the beginning of a new line without actually terminating the line. After you type all parameters, press **Enter**.

- You can create a response file that contains all the necessary parameters. Then type LINK and the name of the response file on the command line. Type LINK `@filename` and press **Enter**.

When specifying LINK commands, you can use the plus sign (+), the semicolon (;), and **Ctrl C** to control the link process.

- You can use the plus sign (+) as well as blanks to separate filenames. You can also extend the response to the Object Modules and Libraries prompts using the plus sign. With a large number of responses, type a plus sign and press **Enter** at the end of the line. LINK repeats either the Object Modules or Libraries prompt and you can continue to type responses. Once you enter all the modules to link and libraries to search, be sure to end the response line with a module name (not with a plus sign) followed by **Enter**.
- Use a semicolon (;) to select default responses.
- Use **Ctrl C** at any time to abort the link session. If you type an erroneous response, such as an incorrect filename, you must press **Ctrl C** to exit and then restart LINK. If you make an error before you press **Enter**, you can backspace to delete the erroneous characters on that line only.

After you enter the last parameter and press **Enter**, LINK begins the linking process. When it's complete, LINK exits to the operating system. When you see the command prompt, you know that the LINK process was successful. If the link session is unsuccessful, an appropriate error message appears.

LINK Parameters—This section describes the parameters LINK requires for operation.

Object module—The first parameter must be the name of the object module. The prompt you see is the following:

```
Object Modules [.OBJ]:
```

Type a list of the object modules you want to link. LINK assumes that the filename extension is .OBJ. If one of your object modules has any other filename extension, you must enter the extension.

Remember that LINK loads segments into classes as it encounters them. Therefore, enter the object modules in the order in which you want LINK to read them.

Separate the object modules by blank spaces or plus signs (+). If a plus sign is the last character you type, the prompt reappears. There is no default; you must enter a response.

Run file—The next parameter is the name of the Run File. The prompt you see is:

```
Run File [Object-filename.EXE]:
```

Type a filename if you want to create a file for storing the executable object code that results from the link session. All Run files receive the filename extension .EXE, even if you specify an extension other than .EXE.

If you don't type a response to the Run File prompt, LINK uses the first filename typed in response to the Object Modules prompt as the Run filename.

List file—The third parameter is the name of the List file. The prompt you see is:

```
List File [NUL.MAP]:
```

This file contains an entry for each segment in the input (object) modules. Each entry shows the addressing in the Run file.

If you don't enter a List filename, LINK does not create a map file.

Libraries—The last parameter is the name of the library files you want LINK to search for external references. The prompt you see is:

```
Libraries [.LIB]:
```

You can enter up to eight library filenames. You must create the library files with a library utility. LINK assumes that the filename extension is .LIB for library files. If you press **Enter** only, LINK searches all files with the .LIB extension.

Separate the library filenames with a blank space or a plus sign (+). If a plus sign is the last character you type, the prompt reappears.

LINK searches your library files in the order you list them to resolve external references. When it finds the module that defines the external symbol, LINK processes that module as another object module.

If LINK cannot find a library file on the disk in the specified disk drive, you see a message instructing you to type a new drive letter:

```
Cannot find library (library-name)
Type new drive letter:
```

LINK switches—You can specify switches to control various LINK functions. You type the switches after each parameter, regardless of how you enter the parameters. If you type more than one switch at the end of a parameter, you must precede each switch with a forward slash (/).

You can abbreviate all the switches. The only restriction is that an abbreviation must be sequential from the first letter through the last letter you type; you cannot have gaps or transpositions. For example, legal and illegal abbreviations for the DSALLOCATE switch include:

Legal	*Illegal*
/D	/DSL
/DS	/DAL
/DSA	/DLC
/DSALLOCA	/DSALLOCT

The remainder of this section describes the switches you can use with LINK.

/CPARMAXALLOC:*n*

This switch sets the maximum number of 16-byte paragraphs that will be allocated for this program when it is loaded into memory by MS-DOS. (*n* can be any number from 1 to 65535.)

LINK normally allocates 65535 paragraphs, which represents all addressable memory. Use this switch to free additional space in memory for other programs.

/DOSSEG

Use this switch to tell LINK to arrange all segments in the executable file according to these rules:

- All segments with the class name CODE are placed at the beginning of the executable file.
- All other segments that do not belong to the group DGROUP are placed immediately after the CODE segments.
- All segments that belong to the group DGROUP are placed at the end of the file.

/DSALLOCATE

Use this switch to tell LINK to load all data at the high end of the data segment. Otherwise, LINK loads all data at the low end of the data segment. At runtime, the DS pointer is set to the lowest possible address in order to use the entire DS segment. Use of the /DSALLOCATE switch in combination with a low default load (that is, the /HIGH switch is not used) permits the user application to dynamically allocate any available memory below the area specifically allocated with DGroup, yet to remain addressable by the same DS pointer. Pascal and FORTRAN programs need this dynamic allocation.

Note

Your application program may dynamically allocate up to 64KB (or the actual amount of memory available) less the amount allocated with DGroup.

/EXEPACK

Use this switch to pack executable files. LINK removes sequences of repeated bytes (typically NULs) and optimizes the load-time relocation table before creating the executable file.

Packed executable files may be smaller and load faster than other files. Programs that have a large number of load-time relocations (about 500 or more) and long streams of repeated characters will usually be shorter if packed. Other programs may not be shorter. You cannot use the Microsoft Symbolic Debug Utility (SYMDEB) with packed files.

/HELP

Use this switch to view a list of the available options on your screen. Do not include a filename when using this switch.

/HIGH

This switch places the Run file as high as possible in memory. Otherwise, LINK places the Run file as low as possible.

Note

Do not use the /HIGH switch with Pascal or FORTRAN programs.

/LINENUMBERS

This switch includes line numbers and addresses to identify the source statements from the input modules in the List file. Otherwise, the List file does not include line numbers.

Note

Not all compilers produce object modules that contain line number information. In these cases, of course, LINK cannot include line numbers.

/MAP

This switch lists all global symbols defined in the input modules. If /MAP is not given, LINK only lists errors (including undefined globals).

LINK lists the symbols alphabetically at the end of the List file. For each symbol, LINK lists its value and its segment:offset location in the Run file.

/NODEFAULT

This switch (which is short for NODEFAULT LIBRARY SEARCH) prohibits a search of the default libraries in the object modules. For example, if you are linking object modules in Pascal, and specify the /NODEFAULT switch, LINK does not automatically search the library named PASCAL.LIB to resolve external references.

/NOGROUP

Use this switch (which is short for NO GROUP ASSOCIATION) to ignore groups associations when assigning addresses to data and code items.

Note

This switch exists strictly for compatibility with older versions of FORTRAN and Pascal (Microsoft versions 3.13 or earlier or any IBM version prior to 2.0). Only use this option to link with object files or libraries produced by these compilers.

/NOIGNORE

This switch (which is short for NO IGNORE CASE) tells LINK to recognize the difference between upper- and lowercase characters. With this switch, LINK treats TWO, two, and Two as different symbols.

Typically, you use this switch with object files created by high-level language compilers.

/OVERLAYINTERRUPT:*n*

Use this switch to set the interrupt number of the overlay loading routine to *n* (*n* can be a value from 0 to 255). This overrides the normal overlay interrupt number of 03FH.

Only use this switch if you are linking with a run-time module from a language compiler that supports overlays. Do not use interrupt numbers that conflict with the standard MS-DOS interrupts.

/PAUSE

LINK pauses during the session when it encounters this switch. Normally, LINK performs the linking session from beginning to end without stopping. This switch allows you to change disks before LINK outputs the Run (.EXE) file.

When LINK encounters the /PAUSE switch, you see the message:

```
About to generate .EXE file
Change disks (hit any key)
```

LINK resumes processing when you press any key.

Note

Do not remove the disk to receive the List file, or the disk containing the VM.TMP file, if one was created.

/SEGMENTS:*n*

Use this switch to process no more than *n* segments per program (*n* can be any number from 1 to 1024). If LINK encounters more than *n* segments, you see an error message and LINK stops. This switch overrides the default limit of 128 segments.

/STACK

Use this switch to specify the size of stack to be created. The format is:

```
/STACK:(number)
```

where *number* represents any positive numeric value (in hexadecimal) up to 65536 bytes. If you type a value from 1 to 511, LINK uses 512.

If you do not specify the /STACK switch, LINK calculates the necessary stack size automatically. All compilers and assemblers should provide information in the object modules that allow the LINK program to compute the required stack size.

At least one object module must contain a stack allocation statement. If not, LINK displays the message:

```
WARNING: NO STACK SEGMENT
```

LINK Processing—LINK creates an executable file by concatenating a program's code and data segments according to the instructions in the original source files. These concatenated segments form an executable image that is copied directly into memory when you run the program. The order in which LINK copies segments to the executable file defines the order in which the executable file is loaded into memory.

You can tell LINK how to link a program's segments using directives that define group associations, classes, and align and combine types. These directives define the order and relative starting addresses of all segments in a program. These directives, which are defined in your object modules, work in addition to any LINK switches you provide on the LINK command line.

Aligning Segments—LINK uses a segment's align type to set the starting address for the segment. The align types are byte, word, paragraph, and page, which represent address boundaries that are multiples of 1, 2, 16, and 256 respectively. The default align type is paragraph.

When LINK encounters a segment, it checks the align type before copying the segment to the executable file. If the align type is word, paragraph, or page, LINK checks the executable image to see if the last byte copied ends at an appropriate boundary. If it does not, LINK pads the image with extra NUL bytes.

LINK computes a starting address for each segment in a program. The starting address is based on a segment's align type and on the size of the segments already copied to the executable file. The address consists of an offset and a frame number, which specifies the address of the first paragraph in memory that contains one or more bytes of the segment.

A frame number is always a multiple of 16 (a paragraph address), and the offset is the number of bytes from the start of the paragraph to the first byte in the segment. For byte and word align types, the offset may be nonzero; for paragraph and page align types, the offset is always zero. The frame number of a segment is the first five hexadecimal digits of the start address specified for the segments.

LINK copies segments to the executable file in the same order that it encounters them in the object files. LINK maintains this order throughout the program unless it encounters two or more segments with the same class name. Segments with identical class names belong to the same class type and are ordered contiguously.

Combining Segments—LINK uses combine types to determine whether or not to combine two or more segments with the same name. Combine types are public, stack, common, memory, at, and private.

LINK automatically combines public combine types with any other segments that have the same name and same class. When combining segments, LINK makes sure that the segments are contiguous and that all addresses in the segments can be accessed using an offset from the same frame address. The result is the same as if the segments were defined as a whole in the source file.

LINK preserves each segment's align type. Even though the segments are combined into one large segment, the code and data in the segments retain their original align type. If the combined segments exceed 64KB, LINK displays an error message.

LINK carries out the same combine operations for stack combine types as for public segments. The only difference for stack combine types is that LINK copies an initial stack-pointer value to the executable file. This stack-pointer value is the offset to the end of the first stack segment (or combined stack segment) that LINK encounters.

If you use the stack type for stack segments, you do not need to give instructions to load the segment into the SS register.

LINK combines common combine types automatically with any other segments with the same name and same class. When combining common segments, LINK places the start of each segment at the same address, creating a series of overlapping segments. The result is a single segment no larger than the largest of the combined segments.

LINK treats segments with memory combine types exactly like segments with public combine types. This combine type is available for compatibility with linkers that support a separate combine type for memory segments.

A segment has a private combine type only if no explicit combine type is defined for it in the source file. LINK does not combine private segments.

Processing Groups—Groups permit noncontiguous segments that do not belong to the same class to be addressable relative to the same frame address. When LINK encounters a group, it adjusts all memory references to items in the group so that they are relative to the same frame address.

Segments in a group need not be contiguous, belong to the same class, or have the same combine type. The only requirement is that all segments in a group fit within 64KB of memory. LINK may encounter a fixup-overflow error if all segments in a group do not fit within 64KB of memory.

Groups do not affect the order in which segments are loaded. For segments to be contiguous, you must use class names and enter object files in the correct order. LINK may even place segments that do not belong to a group in the same 64KB of memory.

LINK Fixups—Once LINK knows the starting address of each segment in a program and establishes all segment combinations and groups, it can fix up any unresolved references to labels and variables. To fix up unresolved references, LINK computes an appropriate offset and segment address and replaces the temporary values (generated by the assembler) with the new values.

LINK processes fixups for four different references: short, near self-relative, near segment-relative, and long.

The size of the value to be computed for the fixup depends on the type of reference. If LINK discovers an error in the anticipated size of a reference, it displays a fixup-overflow message. This type of error can occur if a program attempts to reach an instruction in a segment that has a different frame address or if the segments in a group do not fit within a single 64KB block of memory.

A short reference occurs in JMP instructions that attempt to pass control to labeled instructions in the same segment or group. The target instruction must be no more than 128 bytes from the point of reference. LINK computes a signed, 8-bit number for the JMP instruction and displays an error message if the target instruction belongs to a different segment or group (has a different frame address) or if the target is more than 128 bytes from the point of reference.

A near self-relative reference occurs in instructions that access data relative to the same segment or group. LINK computes a 16-bit offset for this reference and displays an error message if the data are not in the same segment or group.

A near segment-relative reference occurs in instructions that attempt to access data in a specified segment or group or data that is relative to a specified segment register. LINK computes a 16-bit offset for this reference and displays an error message if either of the following conditions exists:

- The offset of the target within the specified frame is greater than 64KB or less than 0.
- The beginning of the frame of the target is not addressable.

A long reference occurs in CALL instructions that attempt to access an instruction in another segment or group. LINK computes a 16-bit frame address and a 16-bit offset for this reference and displays an error message if either of the following conditions exists:

- The computed offset is greater than 64KB or less than 0.
- The beginning of the frame of the target is not addressable.

For a complete description of the LINK process, see the Microsoft Macro Assembler Reference Manual.

Examples

When you type LINK only on the command line, you can respond to the prompts as follows:

Line prompt	*Your response*
`Object Modules [.OBJ]:`	`PGM1 TEXT TABLE +` and press **Enter**
`Object Modules [.OBJ]:`	`PGM2 TABLE2` and press **Enter**
`Run File [PGM1.EXE]:`	`PGM3` and press **Enter**
`List File [NUL.MAP]:`	`PGM3 /MAP` and press **Enter**
`Libraries [.LIB]:`	`LIB2` and press **Enter**

When you enter LINK and all its parameters on one line, you might type:

```
LINK TEXT+TABLE/P/M,,PGMLIST,COBLIB.LIB
```

This command line causes LINK to load the object modules, TEXT.OBJ and TABLE.OBJ. LINK then pauses as a result of the /P switch. When you press any key, the object modules link and the /MAP switch produces a global symbol map. The Run file defaults to TEXT.EXE, PGMLIST.MAP becomes the name of the List file, and LINK searches the library file COBLIB.LIB.

To use a response file with the LINK command, you must first create and save the file to disk. Your response file may look like this:

```
TEXT TABLE PARAM
/PAUSE/MAP
PGMLIST
COBLIB.LIB
```

This response file tells LINK to load the three object modules named TEXT, TABLE, and PARAM. LINK pauses before producing a global symbol map to permit you to swap disks. When you press any key, the output filenames become TEXT.EXE and PMGLIST.MAP. Then LINK searches the library file COBLIB.LIB and uses the default settings for the switches.

This example shows you the type of information that appears on your screen during a LINK session. In response to the MS-DOS prompt, type `LINK`.

Enter your responses when you see these line prompts:

Line prompt	*Your response*
`Object Modules [.OBJ]:`	`IØ SYSINIT` ↵
`Run File [IO.EXE]:`	Enter
`List File [NUL.MAP]:`	`IØ /MAP`
`Libraries [.LIB]:`	Enter

By specifying /MAP, you get both an alphabetical listing and a chronological listing of global symbols.

Once LINK locates all libraries, it displays a map of segments in order of appearance in the load module. The list might look like this:

Start	Stop	Length	Name
ØØØØØH	ØØ9ECH	Ø9EDH	CODE
ØØ9FØH	Ø1166H	Ø777H	SYSINITSEG

The information in the Start and Stop columns shows the 20-bit hex address of each segment relative to location zero. Location zero is the beginning of the load module.

Because you used the /MAP switch, LINK displays the global symbols by name and value. For example:

ADDRESS	PUBLICS BY NAME
ØØ9F:ØØ12	BUFFERS
ØØ9F:ØØØ5	CURRENT DOS LOCATION
ØØ9F:ØØ11	DEFAULT DRIVE
ØØ9F:ØØØB	DEVICE LIST
ØØ9F:ØØ13	FILES
ØØ9F:ØØØ9	FINAL DOS LOCATION
ØØ9F:ØØØF	MEMORY SIZE
ØØ9F:ØØØØ	SYSINIT

ADDRESS	PUBLICS BY VALUE
009F:0000	SYSINIT
009F:0005	CURRENT DOS LOCATION
009F:0009	FINAL DOS LOCATION
009F:000B	DEVICE LIST
009F:000F	MEMORY SIZE
009F:0011	DEFAULT DRIVE
009F:0012	BUFFERS
009F:0013	FILES

You could modify this example in the following ways:

- You can redirect output to the printer by responding PRN to the List File prompt.
- You can use the /LINE switch to produce a listing of all line numbers for all modules. (Note that the /LINE switch may generate a large volume of output.)
- You can press Enter in response to the Libraries prompt to perform an automatic library search.

Chapter 9

Code Page Switching

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Introduction

Code page switching lets your computer use various character sets. If you live in the United States and use only the English character set, you do not need to use this feature. If you live outside the United States or work with other languages, you may want to use this feature to select different character sets.

A character set consists of certain letters, numbers, and symbols that are used for typing, displaying, and printing. Your computer comes with a built-in character set called a code page. Code page switching provides additional character sets that your computer can use.

Each code page, which is identified by a number, contains one character set of 256 characters. The following code pages are available with MS-DOS 3.3:

Code Page Number	*Country or Language*
437	United States (English)
850	Multilingual
860	Portuguese
863	Canada (French)
865	Nordic (Norwegian and Danish)

See Appendix D, Code Page Tables, for illustrations of the exact letters, numbers, and symbols in each of these code pages.

Code page 850, which is new with MS-DOS 3.3, contains all the characters for most European and North and South American countries. This code page provides additional characters that may be useful. The countries with languages that are supported by code page 850 include Australia, Belgium, Canada (English), Canada (French), Denmark, Finland, France, Germany, Italy, Latin America, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland (French), Switzerland (German), the United Kingdom, and the United States (English).

The following table shows the old code pages and the new code pages assigned to each country or language:

Country or Language	*Old Code Page*	*New Code Page*
Arabic countries	437	
Australia	437	850
Belgium	437	850
Canada (English)	437	850
Canada (French)	863	850
Denmark	865	850
Finland	437	850
France	437	850
Germany	437	850
Hebrew	437	
Italy	437	850
Latin America	437	850
Netherlands	437	850
Norway	865	850
Portugal	860	850
Spain	437	850
Sweden	437	850
Switzerland (French)	437	850
Switzerland (German)	437	850
United Kingdom	437	850
United States	437	850

If a file is created using a particular code page, it must be viewed in that code page. Because multiple code pages now exist, you may need to view existing files created with the old code page as well as new files created with the new 850 code page. In this case, you need to use code page switching.

Using Code Page Switching

To use code page switching, you must have an EGA monitor and a printer that comes with the required code pages built-in or that allows downloading of character sets from your computer.

Code page switching requires several MS-DOS commands and files and is used by several commands. Your MS-DOS startup diskette includes two code page information (CPI) files that contain data required to prepare and select code pages:

- EGA.CPI contains code page information related to your EGA monitor
- 4201.CPI contains code page information related to the IBM Proprinter II Model 4201 printer and any printers that emulate the 4201 printer, such as the Epson FX-286™ printer.

You use the following MS-DOS commands to prepare and change the code pages:

CHCP	Changes or displays the current code page. You must install the NLSFUNC command before you use this command.
NLSFUNC	Installs support for code page switching. This command uses the country information provided by the specified file or by the COUNTRY.SYS file (or any other country file you specify with the COUNTRY configuration command).
KEYB	Specifies a keyboard layout and a code page for your keyboard. See Appendix C, International Keyboard Layouts, for the possible keyboard layouts.
SELECT	Creates a system disk that configures your computer for a specific country and keyboard layout. This command creates an AUTOEXEC.BAT file with the KEYB command and a CONFIG.SYS file with the COUNTRY command.

COUNTRY Specifies country-dependent display parameters (such as date and time formats) and activates the default or new code page for the specified country. You enter this command in your CONFIG.SYS file.

DEVICE=DISPLAY.SYS
Installs the DISPLAY.SYS device driver, which sets the hardware code page for your monitor. You enter this command in your CONFIG.SYS file.

DEVICE=PRINTER.SYS
Installs the PRINTER.SYS device driver, which sets the hardware code page for the specified printer. You can enter one or more of these device drivers in your CONFIG.SYS file.

MODE CODEPAGE PREPARE
Prepares one or more code pages for use with a specific device. The device must be previously defined with a DEVICE command in your CONFIG.SYS file.

MODE CODEPAGE SELECT
Selects a prepared code page for a specific device. The device and code page must be previously prepared with the MODE CODEPAGE PREPARE command.

MODE CODEPAGE/STATUS
Displays the code pages currently prepared and selected for a device. The device and code page must be previously prepared with the MODE CODEPAGE PREPARE command.

MODE CODEPAGE REFRESH
Reselects a code page that was deactivated because of a hardware error. You may need to use this command to restore a code page to a printer that was turned off by mistake.

The following commands are affected by the setting of the code page:

GRAFTABL — Provides for displaying graphics characters with decimal values above 127 for a specific code page. These characters can be displayed when your computer is in graphics mode.

SORT — Sorts data based on the active code page.

Setting Up Your System for Code Page Switching

To set up your computer to use a character set other than the United States character set, you need to create a CONFIG.SYS file, and optionally, an AUTOEXEC.BAT file. After you create these files, you must restart MS-DOS to enable the new information.

In your CONFIG.SYS file, include the following commands:

COUNTRY — Use this command to define your country code, code page, and country file with country-specific information.

The code page you specify with this command is the default code page whenever you start the system with this CONFIG.SYS file.

This command sets up country and code page information for your system only. You must also install this type of information for each device attached to your computer.

To use the German language with code page 850, enter the following command in your CONFIG.SYS file:

```
COUNTRY = 049, 850
```

DEVICE — Use this command to set up code page information for your console and printers. The device drivers specify the device type, the hardware code page, and the maximum number of code pages.

If you have an EGA monitor, an Epson FX-286 printer, and an IBM Proprinter II Model 4201, your DEVICE commands might look like this:

```
DEVICE=DISPLAY.SYS CON=(EGA,437,2)
DEVICE=PRINTER.SYS PRN=(4201,437,1)
DEVICE=PRINTER.SYS LPT2=(4201,437,2)
```

The commands you enter in an AUTOEXEC.BAT file are executed automatically when you turn on or reset your computer. In your AUTOEXEC.BAT file, you can include the following commands:

NLSFUNC — Installs support for code page switching. Include this command in your AUTOEXEC.BAT file to ensure that code page switching is installed each time you turn on or reset your computer:

```
NLSFUNC COUNTRY.SYS
```

KEYB — Loads keyboard support and a code page for a specific country or language.

To set up your keyboard for the German language with code page 850, enter this command in your AUTOEXEC.BAT file:

```
KEYB GR, 850
```

MODE CODEPAGE PREPARE

Prepares one or more code pages for use with the device(s) you specified with a DEVICE command in your CONFIG.SYS file.

The number of code pages you prepare for a device depends on the number of code pages you specified in the DEVICE command.

If you installed an EGA monitor, an Epson FX-286 printer, and an IBM Proprinter II Model 4201 in your CONFIG.SYS file, you might prepare them for code page switching with these commands:

```
MODE CON CP PREP=((850)EGA.CPI)
MODE PRN CP PREP=((850)4201.CPI)
MODE LPT2 CP PREP=((850)4201.CPI)
```

If you do not enter these commands in an AUTOEXEC.BAT file, you must execute the necessary commands each time you want to perform code page switching.

Switching Between Code Pages

Once you have installed code page switching for your system and devices, you use two commands to switch between code pages: CHCP and MODE.

CHCP

Selects a code page at the system level. When you use the COUNTRY command, MS-DOS automatically assigns two code pages to your country and selects one of them. To switch to the other code page assigned to your country, use the CHCP command.

To activate code page 850 at the system level for all installed devices, enter the following command:

```
CHCP 850
```

MODE CODEPAGE SELECT

Selects a code page for a specific device. You must have prepared the device with the MODE CODEPAGE PREPARE command.

To activate code page 850 for the CON device, enter the following command:

```
MODE CON CP SEL = 850
```

MODE CODEPAGE REFRESH

Reselects a code page that was deactivated because of a hardware error. You may need to use this command to restore a code page to a printer that was turned off by mistake. You must prepare the code page again and then use this command.

To reselect your printer, enter the following command:

```
MODE PRN CP PREP=((437)4201.CPI)
MODE PRN CP REF
```

Appendix A

Command Quick Reference

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Introduction

This appendix provides an alphabetical summary of all MS-DOS commands. Each command includes a brief description of the command's function and its format. Use this list as a quick reminder, not as a full reference for each command. See Chapters 4 through 8 for complete descriptions.

The word Batch in parentheses identifies batch processing commands, which are described in Chapter 7. DEBUG, EDLIN, EXE2BIN, and LINK are programming tools described in Chapter 8. The other commands are described in detail in Chapters 4 and 5.

The configuration commands are summarized in a separate section at the end of this appendix. You can enter these commands only in a CONFIG.SYS file, which is described in Chapter 6.

External commands are those that reside on your system diskettes and are loaded into memory when called. Internal commands are already in memory and do not show on your directory.

List of Commands

APPEND

External command to set a search path for data files. With the /X switch, also sets a path for executable files.

First time:

```
[d:][path]APPEND [d:]path[;[d:]path...]
[d:][path]APPEND [/X][/E]
```

If APPEND has already been loaded:

```
APPEND [d:]path[;[d:]path...]
APPEND [;]
```

ASSIGN

External command to assign a new letter to a drive specification.

```
[d:][path]ASSIGN [d1=d2...]
```

ATTRIB

External command to set, display, or remove the read-only attribute or archive bit for a file or group of files. Also available through MENU.

```
[d:][path]ATTRIB [±R][±A] [d:][path]filename [/S]
```

BACKUP

External command to back up (copy) one or more files from one disk to another in a special, condensed format.

```
[d:][path]BACKUP d1:[path][filename] d2:[/S][/A]
                 [/F][/M][/D:date][/T:time]
                 [/L[:[d:][path]filename]
```

BREAK

Internal command to enable or disable the **Ctrl C** function.

```
BREAK [ON]
BREAK [OFF]
```

CALL (Batch)

Internal command used in batch processing to call one batch file from another.

```
CALL [d:][path]filename [arguments]
```

CHCP

Internal command to display or change the current code page (character set).

```
CHCP [nnn]
```

CHDIR

Internal command to change or display the current directory.

```
CHDIR [d:][path]
CD [d:][path]
```

CHKDSK

External command to check the directories, files, and file allocation tables on the specified disk and produce a disk and memory status report. Also available through MENU.

```
[d:][path]CHKDSK [d:][path][filename][/F][/V]
```

CLS

Internal command to clear the monitor screen.

```
CLS
```

COMMAND

External command to load a secondary command processor.

```
[d:][path]COMMAND [d:][path][CTTY-dev]
                  [/C command][/E:nnnnn][/P]
```

COMP

External command to compare the contents of one file or group of files to another.

```
[d:][path]COMP [d:][path][filename]
               [d:][path][filename]
```

COPY

Internal command to copy one or more files to the same or another disk and optionally rename or merge them.

```
COPY [d:][path]filename [d:][path][filename]
     [/A][/B][/V]
COPY [d:][path]filename +
     [[d:][path]filename...]
     [d:][path]filename[/A][/B][/V]
COPY [d:][path]filename +,,
```

CTTY
Internal command to change the input/output device.

```
CTTY device
```

DATE
Internal command to set or display system date.

```
DATE [mm-dd-yy]
DATE [dd-mm-yy]
DATE [yy-mm-dd]
```

DEBUG
External utility for debugging machine language programs.

```
[d:][path]DEBUG [[d:][path]filename]
```

DEL
Internal command to delete files.

```
DEL [d:][path]filename
```

DIR
Internal command to list the files in a directory.

```
DIR [d:][path][filename][/P][/W]
```

DISKCOMP
External command to compare the contents of two diskettes. Also available through MENU.

```
[d:][path]DISKCOMP [d1:[d2:]][/1][/8]
```

DISKCOPY
External command to copy whole diskettes. Also available through MENU.

```
[d:][path]DISKCOPY [d1:[d2:]][/1]
```

ECHO (Batch)

Internal command used in batch processing to control the display of batch file commands on the screen.

```
ECHO [ON]
ECHO [OFF]
ECHO [message]
```

EDLIN

External utility for creating and editing text files.

```
[d:][path]EDLIN [d:][path]filename [/B]
```

ERASE

Internal command to erase files.

```
ERASE [d:][path]filename
```

EXE2BIN

External utility for converting .EXE files to .BIN files.

```
[d:][path]EXE2BIN [d:][path]filename
                  [d:][path][filename]
```

EXIT

Internal command to exit the command processor and return to an application program.

```
EXIT
```

FASTOPEN

External command to speed up access to frequently used files and directories on a hard disk.

```
[d:][path]FASTOPEN d:[=nnn] ...
```

FC
External command to compare files on your disk. Also available through MENU.

```
[d:][path]FC [/A][/B][/C][/L][/N][/T][/W][/LB n]
             [/n] [d:][path]filename1
             [d:][path]filename2
```

FDISK
External command to create one or more partitions on a hard disk.

```
[d:][path]FDISK
```

FIND
External command (called a filter) to locate a specified text string within one or more files.

```
[d:][path]FIND [/C][/N][/V] "string"
               [[d:][path]filename...]
```

FOR (Batch)
Internal command used in batch processing to repeat certain batch operations for each item on a list. The format means FOR each item IN a set of items DO the specified command.

```
FOR %%c IN set DO command
```

FORMAT
External command to format disks to accept MS-DOS files. Also available through MENU.

```
[d:][path]FORMAT [d:][/B][/S][/V][/1][/4]
                 [/8][/N:nn][/T:nn]
```

GOTO (Batch)
Internal command used in batch processing to jump to another labelled line within the same batch file.

```
GOTO label
```

GRAFTABL

External command to load a graphics table into memory to enable display of graphics characters in color/graphics mode. Can include a code page number to access an international character set.

`[d:][path]GRAFTABL [nnn][/STATUS]`

GRAPH24

External command to enable printing of CGA screen graphics on a 24-pin or laser printer.

`[d:][path]GRAPH24 [/R]`

GRAPHICS

External command to enable printing of CGA screen graphics on the specified printer.

`[d:][path]GRAPHICS [printer][/R][/B][/P=port][/LCD]`

HDCACHE

External command to store the location and contents of requested sectors of the hard disk in a reserved part of memory.

`[d:][path]HDCACHE [Cn][En]`

HELP

External command to provide information on all MS-DOS commands and utility programs. Also available through MENU.

`[d:][path]HELP [command ...]`

IF (Batch)

Internal command used in batch processing to execute a second command depending on whether a specified condition is true or false.

`IF condition command`

JOIN
External command to connect a drive to a directory on another drive. Omit all parameters to display all joins in effect.

```
[d:][path]JOIN [d1: d2:\directory]
[d:][path]JOIN d: /D
```

KEYB
External command to load a keyboard layout into memory.

```
[d:][path]KEYB [xx[,[nnn], [[d:][path]filename]]]
```

LABEL
External command to create, change, or delete the volume label on a disk.

```
[d:][path]LABEL [d:][volumelabel]
```

LINK
External utility for combining object code program modules.

```
LINK [filename [,filename...] [/switch...]]
LINK @[d:][path]filename
```

MENU
Epson menu utility for performing file utilities, disk utilities, mode settings, and help.

```
[d:][path]MENU
```

MKDIR
Internal command to make a new subdirectory on a disk.

```
MKDIR [d:]path
MD [d:]path
```

MODE

External command to change printer, monitor, or serial port settings and to prepare and control code page switching. Also available through MENU.

Parallel printer mode:

```
[d:][path]MODE LPTn[:][chars][,[spacing][,[P]]]
```

Serial port mode:

```
[d:][path]MODE COMn[:]baud[,[parity]
               [,[databits][,[stopbits][,[P]]]]]
```

Redirecting parallel printer output:

```
[d:][path]MODE LPTn[:]=COMn[:]
```

Display modes:

```
[d:][path]MODE displaymode[,L][,R][,T]
```

Device code page modes:

```
[d:][path]MODE device CODEPAGE PREPARE=((nnn)
              [d:][path]filename)
[d:][path]MODE device CODEPAGE PREPARE=
              ((nnn(,nnn...))[d:][path]filename)
[d:][path]MODE device CODEPAGE SELECT=nnn
[d:][path]MODE device CODEPAGE REFRESH
[d:][path]MODE device CODEPAGE [/STATUS]
```

MORE

External command (called a filter) to display long data listings one screen at a time.

```
[d:][path]command | [d:][path]MORE
MORE < [d:][path]filename
```

NLSFUNC
External command to provide support for code page switching.

```
[d:][path]NLSFUNC [[d:][path]filename]
```

PATH
Internal command to set a search path for programs and batch files that are not in the current directory.

```
PATH [[d:]path1[;[d:]path2...]]
PATH;
```

PAUSE (Batch)
Internal command used in batch processing to suspend execution and show a prompt, so a necessary action can be performed. The specified comment displays if ECHO is on.

```
PAUSE [comment]
```

PRINT
External command to print disk files on a printer while other processing takes place. Also displays the contents of the print queue.

```
[d:][path]PRINT [/D:device][/B:buffersize]
                [/U:busytick][/M:maxtick]
                [/S:timeslice][/Q:queuesize]
                [/T][/C][/P]
                [[d:][path][filename]...]
```

PROMPT
Internal command to change or reset the MS-DOS command prompt. Omit parameters to reset the prompt.

```
PROMPT [string]
```

RECOVER
External command to recover a file or an entire disk containing bad sectors.

```
[d:][path]RECOVER [d:][path]filename
[d:][path]RECOVER d:
```

REM (Batch)
Internal command used in batch processing to add remark lines to batch files.

```
REM [comment]
```

RENAME
Internal command to rename files.

```
RENAME [d:][path]filename1 filename2
REN [d:][path]filename1 filename2
```

REPLACE
External command to selectively replace or add files including subdirectories. Also available through MENU.

```
[d:][path]REPLACE [d1:][path]filename
                  [d2:][path] [/A][/P][/R][/S]
                  [/W]
```

RESTORE
External command to restore files copied with BACKUP command. Also available through MENU.

```
[d:][path]RESTORE d1:[d2:][path][filename]
                  [/M][/N][/P][/S][/A:date]
                  [/B:date][/E:time][/L:time]
```

RMDIR
Internal command to remove (delete) empty directories from a disk.

```
RMDIR [d:]path
RD [d:]path
```

SELECT
External command to format and install MS-DOS on a new disk with the specified country information and keyboard layout.

```
[d:][path]SELECT [d1:d2:[path]] nnn xx
```

SET
Internal command to set or display environment string values in memory.

```
SET [name=[parameter]]
```

SETPRINT
Epson menu utility for setting printer operation parameters.

```
[d:][path]SETPRINT
```

SHARE
External command to install file sharing and locking protection in network situations.

```
[d:][path]SHARE [/F:space][/L:locks]
```

SHIFT (Batch)
Internal command used in batch processing to enable more than 10 replaceable parameters within a batch file.

```
SHIFT
```

SORT
External command (called a filter) to alphabetically or numerically sort text file contents.

```
[d:][path]SORT [/R] [<filename[>filename]][/+n]
```

SUBST
External command to substitute a drive letter for a path name. Omit all parameters to display the current substitutions.

```
[d:][path]SUBST [d1: [d2:]path]
[d:][path]SUBST d: /D
```

SYS
External command to transfer system files to the specified disk.

```
[d:][path]SYS d:
```

TIME
Internal command to set or display system time.

```
TIME [hh:mm[:ss[.cc]]]
```

TREE
External command to display the complete subdirectory tree structure of a disk.

```
[d:][path]TREE [d:][/F]
```

TYPE
Internal command to display the contents of a file on your screen.

```
TYPE [d:][path]filename
```

VER
Internal command to display the MS-DOS version number.

```
VER
```

VERIFY

Internal command to turn on or off the verify function, which verifies each disk write process.

```
VERIFY [ON]
VERIFY [OFF]
```

VOL

Internal command to display a disk volume label.

```
VOL [d:]
```

XCOPY

External command to selectively copy files and, optionally, subdirectories.

```
[d:][path]XCOPY [d1:][path]filename
                d2:[path][filename][/A][/E]
                [/M][/P][/S][/V][/W][/D:date]
```

XTREE

Epson menu utility to enable file management through menus of directory and file commands.

```
XTREE [d:]
```

XTREEINS

External utility to install XTREE for type of monitor.

```
XTREEINS
```

Configuration Commands

BREAK
Configuration command to enable or disable **Ctrl Break** or **Ctrl C** function.

BREAK = ON
BREAK = OFF

BUFFERS
Configuration command to set the number of disk buffers allocated in memory.

BUFFERS = *nnn*

COUNTRY
Configuration command to select display parameters that are country dependent, such as the date and time format, currency symbols, and decimal separator, and activate a code page.

COUNTRY = *code*[,[*page*][,[*d:*][*path*]*filename*]]

DEVICE
Configuration command to install the specified device driver during system startup.

DEVICE = [*d:*][*path*]*filename* [*parameters*]

FCBS
Configuration command to specify the number of file control blocks (FCBs) that can be open at one time.

FCBS = *m,n*

FILES
Configuration command to set the maximum number of files that can be open at one time.

FILES = *nnn*

LASTDRIVE
Configuration command to set the last valid drive letter that MS-DOS will recognize.

```
LASTDRIVE = x
```

SHELL
Configuration command to specify the name and location of a command processor.

```
SHELL = [d:][path]filename [/switches]
```

STACKS
Configuration command to set the number of available stack frames and their size.

```
STACKS = m,n
```

Device drivers

ANSI.SYS
Device driver that provides screen and keyboard control.

```
DEVICE = [d:][path]ANSI.SYS
```

DISPLAY.SYS
Device driver that supports code page switching for the console device (CON).

```
DEVICE = [d:][path]DISPLAY.SYS
         CON[:]=(type,[,[hwcp][,n]])
```

```
DEVICE = [d:][path]DISPLAY.SYS
         CON[:]=(type,[,[hwcp][,(n,m)]])
```

DRIVER.SYS
Device driver that assigns new logical names to diskette drives.

```
DEVICE = [d:][path]DRIVER.SYS /D:ddd
         [/T:ttt][/S:ss][/H:hh][/C][/N][/F:f]
```

EEMM.EXE
Device driver that supports expanded memory on 80386-based computers.

```
DEVICE = [d:][path]EEMM.EXE
```

PRINTER.SYS
Device driver that supports code page switching for parallel printers.

```
DEVICE = [d:][path]PRINTER.SYS
         LPTx(:)=(type[,[hwcp][,n]])
```

VDISK.SYS
Device driver that supports virtual (RAM) disks.

```
DEVICE = [d:][path]VDISK.SYS [cap][sec]
         [dir][/A][/E]
```

Appendix B

Error Messages

Introduction B-2

Error Message Listing B-3

Introduction

There are three types of messages that you can see on your screen:

- MS-DOS utility messages
- MS-DOS device error messages
- Application program messages.

MS-DOS utility and device error messages are listed in this appendix. For information about error messages generated by other software, see the documentation for that application program.

If a disk or device error occurs at any time during a command or program, MS-DOS displays an error message, and includes this prompt:

```
Abort, Retry, Fail?_
```

MS-DOS waits for you to enter one of the following responses:

A Abort. End the program requesting the disk read or write.

R Retry. Repeat the operation. You should use this response when you have corrected the error (for example, with Not ready or Write protect errors).

F Fail. This causes the current MS-DOS system operation to end (fail) and the application to continue. The command line may redisplay so you can retype it.

Note

For a few diskette device errors, the Ignore option may appear. This prompt instead reads `Abort, Retry, Ignore, Fail?` Ignore tells the computer to ignore the bad sector and pretend the error did not occur. This may result in lost data.

Error Message Listing

This section describes MS-DOS messages, their causes, and how to correct them.

`Access denied`
: You tried to replace a write-protected, read-only, or locked file.

`Active Code Page not available from con device`
: The code page that the system is currently using is not supported on the console (screen) you are using.

`All files canceled by operator`
: This message displays when you specify the /T switch (to delete all files in the print queue) with the PRINT command.

`All specified file(s) are contiguous`
: All the files you named are written contiguously (sequentially) on the diskette.

`Allocation error, size adjusted`
: The size of the file indicated in the directory was not consistent with the amount of data actually allocated to the file. The file was truncated to match the amount of data allocated.

`ALT Copy MUST be to Another Disk`
: When entering a destination for the Alt Copy command, you must specify a disk other than the currently logged disk. If you wish to copy files to the same disk, use the Ctrl Copy command.

`APPEND already installed`
: You have already used the APPEND command once since turning on your computer. Now you are trying to use either the /X or /E switch with this command. These switches are only valid the first time you execute the APPEND command.

  To change the append switch, reboot your computer. Then type the APPEND command with the switch you want to use. Otherwise, use the APPEND command without these switches.

`APPEND/ASSIGN Conflict`

You cannot use the APPEND command on an assigned drive. Cancel the drive assignment before using the APPEND command with this drive again.

`Attempt to access data outside of segment bounds, possibly bad object module`

LINK cannot access an Object file.

`Attempted write-protect violation`
`Format failure`

The diskette you want to copy or format is write-protected. If it's safe to copy or format the diskette, remove the write-protect tab (or move the switch) and continue.

`Bad call format reading drive d:`

The length of the request header passed to the device driver was incorrect.

`Bad call format writing drive d:`

The length of the request header passed to the device driver was incorrect.

`Bad command error reading drive d:`

A device driver issued an incorrect command to the device specified in the error message.

`Bad command error writing drive d:`

A device driver issued an incorrect command to the device specified in the error message.

`Bad command or file name`

MS-DOS cannot find the file or command you entered. You either mistyped the filename or command, or the file or command does not exist on the diskette or in the command path.

`Bad numeric parameter`

LINK expects a numeric value and you entered characters other than digits.

`Bad or missing Command Interpreter`

MS-DOS cannot find the COMMAND.COM file on the disk; either the file is missing from the root directory, or the file is invalid. Either restart the system or copy the COMMAND.COM file from your backup MS-DOS startup diskette onto the disk used to start MS-DOS. You will also receive this message if COMMAND.COM has been moved from the directory it was originally in when you started MS-DOS.

`Bad or missing` *`filename`*

You specified an invalid filename for the DEVICE parameter in the CONFIG.SYS file. Check the accuracy of the DEVICE statement in the CONFIG.SYS file.

`Bad or Missing Keyboard definition file`

MS-DOS cannot find the keyboard file that you specified with the KEYB command. Check to see that the file you specified exists on the disk. Also check to see if the path includes the directory in which this file resides. Then, retype the command. If you get this message again, the KEYBOARD.SYS or KEYB.COM file may be corrupted.

`Bad Partition Table`

There is no MS-DOS partition on your hard disk. Run FDISK to create a valid partition.

`Bad unit error reading drive` *`d:`*

Invalid subunit numbers were passed to the device driver.

`Bad unit error writing drive` *`d:`*

Invalid subunit numbers were passed to the device driver.

`Batch file is missing`

Execution of a batch file ended because you changed diskettes.

`BF (Bad flag) error`

You attempted to alter a flag, but the characters you typed were not one of the acceptable pairs of flag values. See the Register command for the list of acceptable flag entries.

BP (Too many breakpoints) error
: You specified more than ten breakpoints as parameters to the Go command. Enter the Go command with ten or fewer breakpoints.

BR (Bad register) error
: You specified an invalid register name in the R (Register) command. Reenter the command using a current register name.

Cannot CHDIR to *directory*–
tree past this point not processed
: CHKDSK is unable to proceed to the specified directory. All subdirectories underneath this directory are not verified.

Cannot CHDIR to root
: CHKDSK is checking the tree structure of the directory and is unable to return to the root directory. CHKDSK is not able to continue checking the remaining subdirectories. Try to restart MS-DOS. If this error persists, the disk is unusable.

Cannot CHKDSK a Network drive
: You cannot check drives that are redirected over the network.

Cannot CHKDSK a SUBSTed or ASSIGNed drive
: You cannot check drives that have been substituted or assigned.

Cannot COPY from (or to) a reserved device
: You cannot copy files from or to this device.

Cannot create a zero cylinder partition
: You are trying to create a partition with a size of 0 cylinders. You must allocate a minimum of 1 cylinder to any partition you create.

Cannot create extended DOS partition while
logical drives exist
: Your disk has one or more logical drives assigned to it. You need to delete them using FDISK before you can create an extended DOS partition.

`Cannot create extended DOS partition without primary DOS partition on disk 1`

You are trying to create an extended DOS partition, but your first hard disk does not contain a primary DOS partition. You need to create the primary DOS partition on your first hard disk. Then, if you have more room on that disk, or if you have a second hard disk, you can create an extended DOS partition.

`Cannot create Subdirectory backup on drive d:`

The disk may be write-protected, full, or the backup subdirectory may already exist and be read-only. Use another disk as a target disk.

`Cannot DISKCOMP to or from an ASSIGNed or SUBSTed drive`

You cannot compare diskettes on drives that have been substituted or assigned.

`Cannot DISKCOMP to or from a network drive`

You cannot compare diskettes on drives that are redirected over the network.

`Cannot DISKCOPY to or from an ASSIGNed or SUBSTed drive`

You cannot copy diskettes on drives that have been substituted or assigned.

`Cannot DISKCOPY to or from a network drive`

You cannot copy diskettes on drives that are redirected over the network.

`Cannot do binary reads from a device`

You cannot do a binary copy when copying from a device. Remove the /B switch or specify an ASCII copy with the /A switch.

`Cannot edit .BAK file–rename file`

You attempted to edit a file with the filename extension .BAK. Either rename the file or copy the .BAK file and give it a different extension.

`Cannot FORMAT a Network drive`
You cannot format diskettes on drives that are redirected over the network.

`Cannot format an ASSIGNed or SUBSTed drive`
You cannot format diskettes on drives that have been substituted or assigned.

`Cannot FORMAT nonremovable drive d`
You are trying to back up files to an unformatted hard disk using the /F switch. You must use a hard disk that is already formatted.

`Cannot JOIN a network drive`
You attempted to JOIN a network drive. You cannot use a network drive for the JOIN command. Retype the command line.

`Cannot LABEL a Network drive`
You cannot label a drive that is shared by a network server.

`Cannot LABEL a SUBSTed or ASSIGNed drive`
You cannot label a drive if it has been substituted with the SUBST command or assigned with the ASSIGN command. Check the command line to be sure you specified a valid label.

`Cannot open temporary file`
LINK is unable to create the file VM.TMP because the disk directory is full. Insert a new disk. Do not remove the disk that will receive the LIST.MAP file.

`Cannot perform a cyclic copy`
When you select the /S switch, you cannot specify a target that is a subdirectory of the source.

`Cannot recover .. entry`
The parent directory (..) is defective.

`Cannot recover . entry, processing continued`
The current directory (.) is defective.

`Cannot RECOVER a Network drive`
You cannot recover files on drives that are redirected over the network.

`Cannot SUBST a Network drive`
You cannot substitute drives that are redirected over the network.

`Cannot SYS to a Network drive`
You cannot transfer system files to drives that are redirected over the network.

`Cannot use FASTOPEN for drive d:`
FASTOPEN works only with local, fixed disks and cannot work with more than four disks at a time.

`Cannot use PRINT - Use NET PRINT`
You must use the NET PRINT command to print files on printers shared over the network.

`Cannot XCOPY from a reserved device`
The source specified is a device such as a printer or an asynchronous communication port, or is NULL. Put the source data into a file and reenter XCOPY, using the file as the source.

`Cannot XCOPY to a reserved device`
The target specified is a device such as a printer or an asynchronous communication port, or is NULL. Select a proper target and reenter XCOPY.

`Can't Delete Root Directory`
It's impossible to delete the root directory; this is a permanent part of every MS-DOS disk. Press any key to continue.

`Can't Rename Root Directory`
Because the root directory is permanently designated by a backslash (\) in MS-DOS, you can't rename it. If this message appears, just press any key to continue.

`CHDIR .. failed, trying alternate method`
CHKDSK was not able to return to a parent directory (..) while travelling the tree structure. It tries to return to that directory by starting over at the root and traveling down.

xxxxxxxx code page drive cannot be initialized

MS-DOS cannot start either the PRINTER.SYS or DISPLAY.SYS program. Check the DEVICE command line in your CONFIG.SYS file for an illegal parameter.

Code page not prepared

You have selected a code page that has not yet been prepared for the system, or one that does not have the correct font to support the current video mode. To prepare a code page for the system, use the MODE PREPARE command. If you have installed the DISPLAY.SYS installable device driver, be sure the DEVICE command line in your CONFIG.SYS file allows for additional subfonts.

Code page *xxx* not prepared for all devices

You have selected a code page that is not currently supported by a device. First, be sure your device supports code page switching, and that it is currently on line. If the device supports code page switching, use the MODE PREPARE command to prepare the device for the code page. Then retry the CHCP command.

Code page *xxx* not prepared for system

CHCP is unable to select a code page for the system. First, make sure that NLSFUNC is installed. If you have not used the DEVICE command in your CONFIG.SYS file to install device drivers, retry the CHCP command. If you are using installable device drivers with your system, you must use the MODE PREPARE command to prepare the specific code page for each device on your system.

Code page operation not supported on this device

You have specified an invalid device and code page combination. Check that the device you specified exists and that you have listed a valid code page. Also check to see that the code page is supported on that device.

Code page requested *xxx* is not valid for given keyboard code

The keyboard code and code page specified are not compatible. Retype the KEYB command with compatible keyboard code and code page.

`Code page specified has not been designated`

You have typed the KEYB command with a keyboard code the system doesn't recognize. You must first prepare the code page for your console screen device. Use the MODE PREPARE command to prepare the code page for CON. Then retype the KEYB command.

`Code page specified has not been prepared`

You have typed the KEYB command with an option the system doesn't recognize. You must first prepare the associated code page for your console screen device. Use the MODE PREPARE command to prepare the associated code page for CON. Then retype the KEYB command.

`Code page specified is inconsistent with invoked code page`

You have selected a KEYB option that does not coincide with the code page for your console screen device (CON). Use the MODE SELECT command to change the code page for CON.

`Code page specified is inconsistent with selected code page`

You have selected a KEYB option that does not coincide with the code page for your console screen device (CON). Use the MODE SELECT command to change the code page for CON.

`Code pages cannot be prepared`

You have either specified a duplicate code page for this device or tried to prepare more than the total number of code pages supported for this device. Check the DEVICE command line in your CONFIG.SYS file to see how many prepared code pages are allowed for this device. Use the /STATUS option of the MODE command to find out which code pages are already prepared for this device.

`COM port does not exist`

You specified a COM port for which there is no hardware.

`Compare process ended`

DISKCOMP displays this message if a fatal error occurred during the comparison.

`Content of destination lost before copy`

A file to be used as a source file to the COPY command has been overwritten prior to completion of the copy. For example, COPY A + B B destroys B before it can be copied.

`Current keyboard does not support this code page`

The code page selected is not compatible with the current keyboard code. Check the code page you have selected. If it is correct, change the keyboard code with the KEYB command.

`Data error reading drive` *`d`*`:`

MS-DOS could not read the data from the disk properly. This is often because of a defective disk. Try pressing **R** (for Retry) several times, or press **A** (for Abort) to end the program. (You should make a new copy of the disk; if it is defective, you may lose information.)

`xxxxxxxx` `device driver cannot be initialized`

You are trying to install a device driver by using a DEVICE command line in your CONFIG.SYS file, but the syntax on the command line is incorrect.

`Device Error during Prepare`

MS-DOS found an error with the specified device when preparing that device for code page switching. The problem may be caused by a device that does not support code pages, a device not properly prepared for code page switching, a device that cannot support more code pages than those already prepared, or a device with a bad or irregular font file. Check the DEVICE command line in your CONFIG.SYS file. Make sure that the command syntax and limits for subfonts and additional code pages are all correct. Also check to see if your device supports code page switching.

`Device Error during Select`

MS-DOS found an error with the specified device. The problem may be caused by a device that does not support code pages, a device not properly prepared for code page switching, a device that cannot support more code pages than those already prepared, or a device with a bad or irregular font file. Check the DEVICE command line in your CONFIG.SYS file. Make sure that the command syntax and limits for subfonts and additional code pages are all correct. Also check to see if your device supports code page switching.

`Device Error during Status`

MS-DOS found an error when checking the device status. The problem may be caused by a device that does not support code pages, a device not properly prepared for code page switching, a device that cannot support more code pages than those already prepared, or a device with a bad or irregular font file. Check the DEVICE command line in your CONFIG.SYS file. Make sure that the command syntax and limits for subfonts and additional code pages are all correct. Also check to see if your device supports code page switching.

`Device Error during write of font file to device`

MS-DOS found an error when it tried to write the font file to the specified device. The problem may be caused by a device that does not support code pages, a device not properly prepared for code page switching, a device that cannot support more code pages than those already prepared, or a device with a bad or irregular font file. Check the DEVICE command line in your CONFIG.SYS file. Make sure that the command syntax and limits for subfonts and additional code pages are all correct. Also check to see if your device supports code page switching.

`Device or code page missing from font file`
MS-DOS did not find a definition of the indicated code page for this device in the font file. Use the MODE command to specify another code page for this device. Also check to see that the font file supports the code page you want to use. This error also may cause specified code pages to be undefined. Use the MODE command to prepare and refresh lost code pages.

`Device` *`ddd`* `not prepared`
No code page has been prepared for this device.

`DEVICE support Not Present`
The disk drive does not support MS-DOS 3.3 device control.

`DF (Double flag) error`
You typed two values for one flag. You may specify a flag value only once per RF command.

`Directory Count Overflow`
TREE can scan up to 3,000 subdirectories on a disk. If more than this number are present, this error message appears.

`Directory Full`
The directory you're working with has reached the logical limit of the number of files it can contain. You must delete some files before adding more.

`Directory is joined`
CHKDSK cannot process directories that are joined. Use the JOIN /D command to unjoin the directories, then run CHKDSK again.

`Directory is totally empty, no . or ..`
The specified directory does not contain references to a current or parent directory. Delete the specified directory and recreate it.

`Directory not empty`
You cannot delete or join a directory if it contains files or a subdirectory. For XTREE and RMDIR, delete the files and subdirectories first, then the directory. For JOIN, delete the files and subdirectories, or create a different directory.

`Disk Drive Error: Abort, Ignore, Retry?`

Various disk drive problems can generate this message, such as a physically damaged or incorrectly inserted disk. The most likely possibility is that no disk is in the drive.

Check your drive and disk to make sure they are in order; then press **R** to retry. If this fails, press **A** to abort the program. Then restart XTREE and retry the operation. If the problem continues, you probably have a defective disk.

`Disk error reading drive d:`

MS-DOS could not read the data from the disk properly. This is often caused by a defective disk. Try pressing **R** (for Retry) several times, or press **A** (for Abort) to end the program. (You should make a new copy of the disk; if it is defective, you may lose information.)

`Disk error writing drive d:`

MS-DOS could not write the data to the disk properly. This is often caused by a defective disk. Try pressing **R** (for Retry) several times, or press **A** (for Abort) to end the program. (You should make a new copy of the disk; if it is defective, you may lose information.)

`Disk error reading FAT n`

One of your file allocation tables (*n* is 1 or 2) has a defective sector in it. MS-DOS automatically uses the other file allocation table. It is a good idea to copy all your files to another diskette.

`Disk error writing FAT n`

One of your file allocation tables (*n* is 1 or 2) has a defective sector in it. MS-DOS automatically uses the other file allocation table. It is a good idea to copy all your files onto another diskette.

`Disk Full`

Discontinue adding files, or direct the files to another disk.

`Disk full. Edits lost`

EDLIN could not save your file due to lack of disk space.

`Disk full-write not completed`

You gave the End command, but the diskette did not contain enough free space for the file. EDLIN aborted the End command and returned you to the operating system. Part of the file may have been written to diskette. Only a portion (if any) of the file has been saved. You should probably delete that portion of the file and restart the editing session. The file will not be available after this error. Always be sure that the diskette has sufficient free space for the file to be written to diskette before you begin your editing session.

`Disk Has Been Changed`

XTREE reads your disk's file structure when you log on and retains it in memory. If you change a disk without logging on and attempt an operation on that disk, XTREE gets caught in the difference between the record in memory and the actual structure on the disk. Log onto each disk so that XTREE can read the correct file structure; then retry the operation.

You may see this message if you return from an Alt eXecute command and attempt to execute certain XTREE commands. If, during the Alt eXecute, you added, removed, or changed any files or directories on the logged disk, XTREE may have problems. Log onto this disk again to avoid further warnings.

`Disk unsuitable for system disk`

FORMAT detects a bad track on the diskette where system files should reside. You should only store data (and not system tracks) on this diskette.

`Diskette bad or incompatible`

The source disk is not formatted, or incorrectly formatted. You cannot copy it.

`Do not specify filename(s)`
`Command format: DISKCOMP d: d:[/1][/8]`

You specified an incorrect switch or gave a *filename* in addition to a drive name.

`Divide overflow`

The divide overflow flag has been set; this is usually caused by division by zero.

`. Does not exist`
`.. Does not exist`

These information messages from CHKDSK indicate that either the current or parent directory entry is invalid.

`Drive d already deleted`

You tried to delete drive *d*, but it has already been deleted.

`Drive d: not ready`

Your diskette drive isn't ready to operate. Either the disk in the drive is write-protected or it is not inserted correctly. Check these two possibilities; then select Retry or Abort and press **Enter**.

`Drive d: not ready`
`Strike any key when ready`

The specified drive can't be read because it isn't ready. To correct this, just check that the disk is fully inserted and the drive latch is closed. Press any key to continue.

`Drive letter must be specified`

You did not specify the letter of the drive you want to format.

`Drive types or diskette types not compatible`

You must have the same size and type of disks to run DISKCOMP or the same type of drives to run DISKCOPY. For example, you cannot use DISKCOPY to copy from a 5¼-inch diskette to a 3½-inch diskette or use DISKCOMP to compare a high-density diskette with a low-density diskette. Use COMP or FC to compare files on differently formatted diskettes. To copy the file on a disk, you can use COPY or XCOPY.

`Duplicate filename`

You tried to rename a file to a filename that already exists, or the file to be renamed does not exist.

`Entry error`

The last command you typed contained a syntax error. Retype the command with the correct syntax and press **Enter**.

`Entry has a bad attribute`
`Entry has a bad link`
`Entry has a bad size`

This message may be preceded by one or two periods that indicate which subdirectory is invalid. If you have specified the /F switch, CHKDSK attempts to correct the error.

`Error: dup record too complex`

A DUP record in an assembly language module is too complex. Simplify the DUP record in your assembly language program.

`Error during read of Font file`

MS-DOS found an error when it tried to read the font file for the specified code page.

`Error: fixup offset exceeds field width`

An assembly language instruction refers to an address with a short instruction instead of a long instruction. Edit your assembly language source and reassemble.

`Error in country command`

You used incorrect syntax for the COUNTRY command in your CONFIG.SYS file.

`Error in .EXE file`

The .EXE file you asked MS-DOS to load has an invalid internal format.

`Error Occurred during Formatting`

A variety of conditions can produce this error. Consult your dealer.

`Error opening log file`

MS-DOS cannot open the BACKUP log file. Check the drive and path specified with this command. Remember that the log file cannot be located on the target drive. If you did not specify a filename for the log, the error occurred when MS-DOS tried to open and create BACKUP.LOG on the source disk.

`Error reading/writing partition table`

FORMAT could not read or write the partition table. Run FDISK to check the partition table, then try formatting again.

`Error trying to open backup log file`
`Continuing without making log entries.`

You specified the BACKUP /L switch, but BACKUP could not create the BACKUP log file.

`Error writing to device`

You tried to send too much data to a device. MS-DOS was unable to write the data to the specified device.

`Errors found, F parameter not specified`
`Corrections will not be written to diskette`

CHKDSK found errors on the diskette. You must specify the /F switch if you want CHKDSK to correct the errors it finds on the diskette.

`Errors on list device indicate that it may be off-line. Please check it`

Your printer is off line.

`EXEC failure`

MS-DOS either found an error when reading a command or the FILES statement in the CONFIG.SYS file is set too low. Increase the value and restart MS-DOS.

`Extended DOS partition already exists`

You can create only one extended DOS partition.

`Failed to open HELP.TXT`

HELP could not find the HELP.TXT file. HELP.COM and HELP.TXT must be in the same directory, or APPEND must be set to the directory that contains HELP.TXT.

`Failure to access code page font file`

MS-DOS cannot open the font file for the specified code page. Check to see that you typed the correct drive, filename, and pathname for the code page information file you are using. Also check the CONFIG.SYS file to see that the device driver for this device has been properly installed. If the CONFIG.SYS file is incorrect, correct it and restart MS-DOS before retyping the MODE command.

`Failure to access country.sys`

MS-DOS cannot open the COUNTRY.SYS file. Check to see that your path points to the directory in which COUNTRY.SYS resides. Then retype the command.

`Failure to access device: xxx`

You are trying to specify a code page for a particular device, but MS-DOS cannot access the device listed. Retype the command using an existing device. Make sure you are typing the device name correctly.

`Failure to access keyboard.sys`

MS-DOS cannot open the KEYBOARD.SYS file. Be sure KEYBOARD.SYS exists on your source disk and you have entered the correct pathname.

`Fastopen already installed`

FASTOPEN is already installed on the system.

`FC: Cannot open filename - No such file or directory`

FC could not find the filename you specified. Check your directory for the correct filename.

`FC: Incompatible switches`

You specified switches that are not compatible; for example, /B and /L cannot be used together. Do not combine binary and ASCII comparison switches.

`FC: filename longer than filename`

After reaching the end of one of the files in a binary file comparison, the other file still has uncompared data.

`FC: Out of memory`

You do not have enough memory to perform the comparison.

`FCB unavailable reading drive d:`

An unusual error has occurred. This error usually requires an experienced programmer to fix it. Press **R** (for Retry) or **A** (for Abort).

`FCB unavailable writing drive d:`

An unusual error has occurred. This error usually requires an experienced programmer to fix it. Press **R** (for Retry) or **A** (for Abort).

`File allocation table bad`

The diskette may be defective. Run CHKDSK with /F to repair the diskette.

`File allocation table bad drive d:`

The diskette in drive *d* may be defective. Run CHKDSK to check the diskette. If the error persists, assume the diskette is not usable and reformat it.

`File filename canceled by operator`

MS-DOS displays this message when you specify the /T switch with the PRINT command.

`File cannot be converted`

CS:IP does not meet either of the necessary criteria, or it meets the .COM file criterion but has segment fixups. This message also displays if the file is not a valid executable file.

`File cannot be copied onto itself`

You specified the same filename (on the same COPY diskette) for both the source and destination. For example: `COPY A A`.

`File creation error`

You tried to add a new filename or replace a file that already exists in the directory, or there was not enough space for the file. If the file already exists, it is a read-only file and cannot be replaced. This error message may also occur if the root directory is full, out of files, or if the filename is the same as a volume or directory, or is a hidden (or system) file.

`File is READ-ONLY`

You cannot erase or write over a read-only file. Use the ATTRIB command to change a file's status to read/write through its -R option.

`File not found`

MS-DOS cannot find the file you specified. Check to see that the path name is accurate and that the file exists in the directory you specified.

`File not in PRINT queue`

The file that you specified was not in the print queue, so you cannot remove it from the queue. Check to see that you entered the filename correctly.

`filename` `cancelled by operator`

This message is printed on the printer when you specify the /T switch to stop printing *filename* in the PRINT command.

`filename` `is not on the current disk or path`
`Press any key to continue . . .`

You tried to run DU or MENU from a disk that does not have the individual commands on it, or PATH has not been used to set the proper path to these commands.

`filename` `is cross linked on cluster`

Make a copy of the file you want to keep, and then delete both files that are cross-linked.

`Filename must be specified`

You did not specify a filename when you started EDLIN.

`FIND: Access denied`

You cannot access the file. Make sure that the disk is not write-protected, read-only, or locked.

`FIND: File not found`

The specified filename does not exist or MS-DOS cannot find it in the specified path.

`FIND: Invalid number of parameters`

You omitted a string in the FIND command.

`FIND: Invalid Parameter`

One of the switches you specified is wrong.

`FIND: Read error in` *`filename`*

An error occured when FIND tried to read the specified file.

`FIND: Syntax error`

You typed an invalid string in the FIND command, or did not include the string, or did not format the command properly. An invalid string is one that does not have quotes around it or contains a line-feed or end-of-file character.

`First cluster number is invalid,`
`Entry truncated`

The file directory entry contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

`FIRST diskette bad or incompatible`

DISKCOMP cannot recognize the format on the source disk. Run CHKDSK to identify the problem.

`Fixups needed–base segment (hex:)`

The source (.EXE) file contained information indicating that a load segment is required for the file. Specify the absolute segment address where you want to store the finished module.

`Font File contents invalid`

MS-DOS cannot use the contents of the specified font file. Make sure you are typing the name of the font file correctly. Retype the command. If this message is displayed again, your font file may have been altered or corrupted. Recopy this file from the backup MS-DOS system disk and type the command again. This error may also cause existing selected code pages to be undefined. Use the MODE command to prepare these code pages again, and to refresh them.

`FOR cannot be nested`

You cannot nest FOR statements within other FOR commands.

`Format Cancelled–Controller RAM Diagnostic Error`

The RAM controller on the disk has a problem. Consult your dealer.

`Format failure`

MS-DOS could not format the diskette. This message always displays in conjunction with an explanation as to why MS-DOS could not format the diskette.

`Format not supported on drive` *`d`*`:`

You cannot use FORMAT to format disks in this drive. You may have specified device parameters that your computer cannot support.

`General failure reading drive` *`d`*`:`

An unusual error has occurred. This error usually requires an experienced programmer to fix it. Press **R** (for Retry) or **A** (for Abort).

`General failure writing drive` *`d`*`:`

An unusual error has occurred. This error usually requires an experienced programmer to fix it. Press **R** (for Retry) or **A** (for Abort).

`Graphics characters already loaded`

The GRAFTABL command displays this message if you have already loaded the table of graphics characters into memory.

`Hard disk drive not ready or not installed-aborting. Press any key to exit the program`

Either your system does not contain a hard disk or it is having trouble recognizing it. If you have a hard disk and get this message, consult your dealer.

`Has invalid cluster, file truncated`

The file directory entry contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

`Illegal device name`

The system does not recognize this device name.

`Incompatible system size`

The system files occupy more space on the source disk than is available on the target disk. You cannot use SYS to transfer the system files to this disk.

`Incorrect APPEND Version`

You are using an incompatible version of the APPEND command with MS-DOS 3.3. Use only the version that comes with MS-DOS 3.3.

`Incorrect DOS Version`

Some MS-DOS utilities will not run on older versions of the operating system, and many are written to run only on the exact version of MS-DOS they were created for. You must use the correct version of MS-DOS to run this command.

`Incorrect DOS Version, use DOS 2.ØØ or later`

Some MS-DOS utilities will run only on MS-DOS version 2.00 or later versions.

`Incorrect number of parameters`

The command line contains too many or too few options. Retype the command line.

`Incorrect parameter`

You specified an incorrect parameter.

`Infinite retry on parallel printer timeout`

Your printer is probably off line or not ready. If the printer appears to be ready, you may have to press the **Ctrl-Alt-Del** keys to reset the computer.

`Input file read error`

A read error was encountered in the Object file. Use a valid object module.

`Insufficient disk space`

The disk is full and does not contain enough room to perform the specified operation.

`Insufficient memory`

There is not enough memory in your computer to perform the specified operation. Before retrying this operation, you must free memory by deleting files. In EDLIN, you may be able to free memory by entering a W (write) command followed by an A (APPEND) command.

`Insufficient memory for system transfer`

Your memory configuration is insufficient to transfer the MS-DOS system files with the FORMAT /S switch.

`Insufficient room in root directory`
`Erase files in root and repeat CHKDSK`

CHKDSK always recovers lost files into the root directory. In this case, your root directory is full. Delete some files in your root directory or move them to another disk or directory to make room for the lost files.

`Intermediate file error during pipe`

The pipe operation uses temporary files on the disk that are deleted automatically once the piping process is complete. An error has occurred in one of these files. Make sure that there is enough room on the disk for the temporary file and that the disk is not write-protected, and try the command again.

`Internal error`

This message indicates an internal logic error in the FC utility. You may have used wildcard characters when specifying the filename.

`Internal stack overflow`
`System Halted`

The system tried to use more stacks than were available. This caused a series of hardware interrupts and halted the system. Restart MS-DOS. Then edit your CONFIG.SYS file and allocate more stack resources.

`Invalid argument`

You have specified an invalid argument. Check the correct syntax of the command and try again.

`Invalid baud rate specified`

You have specified an incorrect baud rate. Valid choices are 110, 150, 300, 600, 1200, 2400, 4800, 9600, and 19200. You must specify at least the first two digits of the baud rate.

`Invalid characters in volume label`

The volume label should contain only up to 11 alphanumeric characters.

`Invalid code page specified`

You selected an invalid code page number. Retype the command with the correct code page.

`Invalid country code`

In your CONFIG.SYS file you have specified a country number that is not in the table of files configured in this version of MS-DOS. Country codes must be in the range 0-199.

`Invalid country code or code page`

MS-DOS found an invalid country code or code page number in your CONFIG.SYS file. Correct the COUNTRY command line in your CONFIG.SYS file.

`Invalid COMMAND.COM`
`Insert COMMAND.COM disk in default drive and strike any key when ready`

The application you have just run used up most of memory and wrote over the COMMAND.COM file. MS-DOS needs to reload COMMAND.COM, but cannot find the file on the diskette or the file found is invalid. Insert a system diskette with COMMAND.COM into the default drive. This version of COMMAND.COM must be the same as the one with which you started MS-DOS.

`Invalid COMMAND.COM`
`Insert COMMAND.COM disk in drive d: and strike any key when ready`

The application you have just run used up most of memory and wrote over the COMMAND.COM file. MS-DOS needs to reload COMMAND.COM, but cannot find the file on the diskette or the file found is invalid. Insert a system diskette with COMMAND.COM into the specified drive (*d:*). This version of COMMAND.COM must be the same as the one with which you started MS-DOS.

`Invalid current directory`

Your disk is bad. Replace the disk or make another copy from your backup MS-DOS startup disk.

`Invalid date`

You specified an invalid date in response to the DATE prompt. Enter a valid date in the appropriate format.

`Invalid Date/Time`

You specified an invalid date with one of the BACKUP command switches.

`Invalid device`

The device specified was not AUX, CON, LPT, NUL, or PRN.

`Invalid device parameters from device driver`

FORMAT displays this message when the number of hidden sectors is not evenly divisible by the number of sectors per track (that is, the partition does not start on a track boundary). This might happen if you tried to format a hard disk that previously had been formatted with MS-DOS 2.x without first running FDISK, or if you have set the device driver parameters incorrectly. Check the CONFIG.SYS file for incorrect DEVICE commands.

`Invalid directory`

The directory you specified either does not exist or is invalid. Check to see that you entered the directory name correctly.

`Invalid disk change reading drive d:`

You changed the disk in a drive when you weren't supposed to. Put the disk back in the drive and press **R** (for Retry).

`Invalid disk change writing drive d:`

You changed the disk in a drive when you weren't supposed to. Put the disk back in the drive and press **R** (for Retry).

`Invalid Disk Drive`

The drive specified doesn't exist. Specify a valid drive letter.

`Invalid drive in search path`

An invalid drive descriptor was found in one of the paths specified by PATH. Specify a valid diskette drive descriptor.

`Invalid drive or filename`

The specified drive or filename is invalid. Specify a valid drive or a valid filename.

`Invalid drive specification`

The specified drive descriptor is invalid. Specify a valid drive.

`Invalid Entry`

The characters you input in response to a prompt are not acceptable. XTREE's input protection feature automatically rejects numbers or symbols where letters are required, such as extra periods in filenames. Check your input and retry the operation.

`Invalid environment size specified`

You set the environment size with an incorrect number of bytes. The number must be between 160 and 32768.

`Invalid filename or file not found`

You entered a wildcard character in the filename or extension. MS-DOS does not allow wildcard characters with the TYPE command.

`Invalid keyboard code specified`

You selected an invalid keyboard code with the KEYB command. Retype the command with the correct keyboard code.

`Invalid language specified`

You typed an invalid keyboard code with the KEYB command. Retype the command using a valid keyboard code.

`Invalid number of parameters`

Either you did not specify an option or string, or you specified the wrong number of options in the command line.

`Invalid object module`

An object module is incorrectly formed or incomplete (as when assembly is stopped in the middle). Use a valid object module.

`Invalid operation: R/O file`

The file you specified is read only; you cannot alter it.

`Invalid parameter(s)`

One of the specified parameters is invalid. Correct the command line.

`Invalid path`

You specified an incorrect path name. Retype the command line.

`Invalid path, not directory or directory not empty`

One of the names specified in a path is not a directory, or the specified directory contains files or subdirectories. The directory is not removed.

`Invalid path (or file not found)`
The file specification is incorrect. Enter the command with a correct path and filename.

`Invalid path or parameter`
You specified a file or directory that does not exist. Enter a valid pathname or filename with the APPEND command.

`Invalid signature in COUNTRY.SYS file`
SELECT reads the COUNTRY.SYS file to verify the country code and quits if it cannot find a proper file header or a specific country code.

`Invalid signature in KEYBOARD.SYS file`
SELECT reads the KEYBOARD.SYS file to verify the keyboard code and quits if it cannot find the proper file header or a specific keyboard code.

`Invalid STACK parameter`
The syntax of the STACK command in your CONFIG.SYS file includes an invalid parameter. Correct the syntax of the configuration command.

`Invalid sub-directory entry`
The subdirectory that you specified either does not exist or is invalid. Check to see that you entered the subdirectory name correctly.

`Invalid syntax`
You used the wrong syntax when typing a command. See Chapter 4 for the correct syntax of an MS-DOS command.

`Invalid syntax on DISPLAY.SYS code page driver`
You used the wrong syntax when you typed the DEVICE command in your CONFIG.SYS file to load DISPLAY.SYS.

`Invalid syntax on PRINTER.SYS code page driver`
You used the wrong syntax when you typed the DEVICE command in your CONFIG.SYS file to load PRINTER.SYS. See Chapter 6 for the correct syntax of DEVICE.

`Invalid syntax on PRINTER.SYS code page switching device drivers`

You used the wrong syntax when you typed the DEVICE command in your CONFIG.SYS file to load PRINTER.SYS. See Chapter 6 for the correct syntax of DEVICE.

`Invalid time`

You specified an invalid time. See the description of TIME in Chapter 4 for the correct syntax.

`Invalid Volume ID`

FORMAT displays this message when you ask to format a hard disk, but enter a volume label that does not match the volume label on the disk. The format is aborted.

`Invalid working directory process cannot continue`

The current directory of the disk being checked is damaged and unusable.

`x` `is not a choice, Please enter` *`y-z`*

You tried to select an invalid option *x*. Select a valid option from the range shown (*y-z*).

`KEYB has not been installed`

No alternate keyboard code has been installed for your system. If you want to use a keyboard code other than the default U.S. (QWERTY) keyboard, use the KEYB command to install it.

`Label not found`

There is a GOTO command to a nonexistent label in a batch file.

`*** Last file not backed up ***`

BACKUP could not back up the last file on the disk. This message may occur if there is no more room on the target disk. It may also occur if there was an error in the source file, or on the target disk. You may have to back up this file separately to another disk.

`Line too long`

During a Replace command, the string given as the replacement caused the line to expand beyond 253 characters. Divide the line into two lines and retry the Replace command.

`List output is not assigned to a device`

When you first run PRINT, it asks you what device you want to specify as a print spooler. This message appears if PRINT is set up for a nonexistent device.

`Lock violation reading drive d:`

A program tried to access part of a file that another program was using. Press **A** (for Abort), or wait awhile and press **R** (for Retry).

`Lock violation writing drive d:`

A program tried to access part of a file that another program was using. Press **A** (for Abort), or wait awhile and press **R** (for Retry).

`LPTx: not redirected`

MODE could not redirect the parallel printer port. Check to see whether you have specified the proper options.

`Maximum number of logical DOS drives installed`

You have installed the maximum number of logical DOS drives allowed by MS-DOS. You cannot create any more logical DOS drives.

`Memory allocation error.`
`Cannot load MS-DOS, system halted`

Restart MS-DOS. If this error continues, make a new copy of the MS-DOS startup disk from your backup copy.

`Missing from the file is either the device ID or the code page`

The code page specified is not supported in the code page information (.CPI) file, or the .CPI file does not support the printer specified.

`MOVE file MUST be to the Same Disk`

When entering the destination path for a Move operation, do not specify a disk. XTREE moves files to a directory that is on the same disk as the original directory. To move files to another disk do the following:

- Tag the files to be moved.
- Use the Ctrl Copy command to create copies on the destination disk.
- Use the Ctrl Delete command to remove the original files.

`Must specify COM1, COM2, COM3 or COM4`

You must specify a serial port.

`Must specify destination line number`

You must specify a destination line number when you are copying and inserting lines with EDLIN.

`Must specify ON or OFF`

The command requires either an ON or an OFF parameter.

`Name Exists`

In order to prevent confusion, MS-DOS prevents you from using identical names for files, directories, and volume labels. Files may have identical names if they are in separate directories, but any other duplication of names (such as directory and file, directory and volume label, or file and volume label) are not acceptable.

This message appears if you attempt to make such a duplication, or if you try to rename a directory or file with a name already in use. Choose a different name and try the operation again.

`New file`

This message appears if EDLIN does not find a file with the name you specified. If you are creating a new file, ignore this message. If you do not intend to create a new file, check to see that you correctly typed the filename of the file you wish to edit.

`NLSFUNC already installed`
NLSFUNC stays resident in memory once it is initialized. You have already loaded it into memory.

`No Append`
No paths have been appended. If you would like to append a path for data files, use the APPEND command.

`No appended directories`
You did not specify a path with the APPEND command.

`No code page has been selected`
No code pages have been selected for the system. If you would like to select a code page, use the CHCP command.

`No COM: ports`
Your computer does not have an asynchronous communications (serial) port.

`No files added (or replaced)`
The REPLACE command did not add or replace any files.

`No files found` *`filename`*
REPLACE could not find matching source or target files.

`No files match` *`filespec`*
You gave a PRINT command to add to the queue, but no files match the file specification.

`No free file handles.`
`Cannot start COMMAND.COM, exiting`
Restart MS-DOS. If this message recurs, increase the FILES command value in the CONFIG.SYS file.

`No logical drives defined`
There are no logical drives defined for your system.

`No paper error writing device dev`
The printer is either out of paper or not turned on.

`No path`
You typed PATH to find out what your search path is without previously setting a command search path.

`No primary DOS partition to delete`
You have selected the FDISK option to delete your primary MS-DOS partition, but that partition does not exist.

`No room for system on destination disk`
There is not enough room for the system files on the destination diskette. Delete some files to make room for the system files or use another diskette.

`No room in directory for file`
You attempted to create a new file with EDLIN, and either the file directory was full or you specified an illegal diskette drive or filename.

Check the command line that started EDLIN for an illegal filename or diskette drive. If the command is no longer on the screen and if you have not yet typed a new command, you can recover the EDLIN start command by pressing **F3**.

If this command line contains no illegal entries, run the CHKDSK program for the specified diskette drive. If the status report shows that the diskette directory is full, remove the diskette. Insert and format a new diskette.

`No room in root directory`
There is not enough room in the root directory for a volume label. Delete or move some of the files from the root directory to make room for the volume label.

`No source drive specified`
You must specify a source drive.

`No space left on device`
You cannot back up or restore any more files, and you cannot send any more output from a file comparison to your disk because the target disk is now full. You should probably delete some of the files on the disk to make more room.

`No space to create logical drive`
You are trying to create a logical drive, but there is no space available to do so.

`No sub-directories exist`
You have specified the /F switch, but the directory does not contain subdirectories.

`No such file or directory`
One or more of the files or directories you specified does not exist.

`No target drive specified`
You must specify a target drive for the BACKUP command.

`Non-DOS disk error reading drive d:`
MS-DOS does not recognize the disk format because the disk is missing information or contains another operating system. Try running the CHKDSK command to correct the problem. If running CHKDSK does not solve the problem, you should reformat the disk using the FORMAT command—even though this will destroy all the files on the disk.

`Non-DOS disk error writing drive d:`
MS-DOS does not recognize the disk format because the disk is missing information or contains another operating system. Try running the CHKDSK command to correct the problem. If running CHKDSK does not solve the problem, you should reformat the disk using the FORMAT command—even though this will destroy all the files on the disk.

`Non-standard version of Graphic Character Set Table is already loaded`
MS-DOS cannot recognize the current table of graphics characters because it has been modified since it was loaded.

`Non-system disk or disk error`
`Replace and strike any key when ready`
Replace the disk with the MS-DOS startup disk, and press any key.

`Not a graphics printer file`
The file you are printing does not contain graphics.

`*** Not able to back up (or restore) file ***`
This message may occur if there was an error in the source file or on the target disk. Use the CHKDSK command on the source disk to see if you can determine the problem.

`Not enough memory`
There is not enough memory for MS-DOS to run the command.

`Not enough room to merge the entire file`
There was not enough room in memory to hold the file during an EDLIN Transfer command. You must free some memory by writing some files to diskette or deleting some files before you can transfer this file.

`Not found`
You have specified a Search or a Replace command that did not find a further occurrence of the specified string.

`Not ready error reading drive d:`
The device (usually a drive or printer) specified in the error message is not ready to accept or transmit data. This often happens when the disk drive door is open. If this is the problem, close the door and press **R** (for Retry), or check to see if the printer is on and ready to print.

`Not ready error writing drive d:`
The device (usually a drive or printer) specified in the error message is not ready to accept or transmit data. This often happens when the disk drive door is open. If this is the problem, close the door and press **R** (for Retry), or check to see if the printer is on and ready to print.

`One or more CON code pages invalid for given language`
KEYB examined all prepared code pages, and has found that at least one code page is incompatible for your screen console device (CON). This is only a warning to let you know that your keyboard and screen console device are working from different code pages.

`Only non-bootable partitions exist`
None of the MS-DOS partitions are set up to boot MS-DOS.

`Only partitions on drive 1 can be made active`

You cannot create an active partition on a hard disk other than the first hard disk drive.

`Out of environment space`

There is not enough room in the program environment to accept more data. To increase the size of the existing environment, use the /E switch with the COMMAND command or remove some of the existing environment variables by using the SET command.

`Out of Memory`

During a Copy operation or a Make Directory operation, you have attempted to create more files or directories than XTREE can process. Make space on the diskette by removing any unwanted files and/or directories.

`Parameters not compatible`

You entered conflicting parameters in the FORMAT command line. Perhaps you entered the /S and /B switches, which cannot both be used because MS-DOS is unable to create a blank system area, and an occupied system area, on the diskette simultaneously. It is also impossible to have a volume label on an 8-sector diskette (/V /8). Retype the command line with consistent parameters.

`Parameters not compatible with fixed disk`

You have used a switch that is not compatible with the specified hard disk drive.

`Parameters not supported`

You used a parameter that MS-DOS does not support.

`Parameters not supported by Drive`

FORMAT displays this message when the device driver for this drive does not support Generic IOCtl function requests.

`Partition selected (x) is not bootable, active partition not changed`

You are trying to change active partitions, but MS-DOS cannot be booted from the selected partition.

`Partition table empty`
You have already deleted all partitions from the table.

`Partition table full - cannot add`
You have already placed the maximum number of partitions in the partition table.

`Path(name) too long`
The pathname you specified was too long. You may have to change directories to use this command with files in deep subdirectories.

`Path not found`
You specified an invalid pathname. Check to see that you are correctly entering the pathname.

`Primary DOS partition already exists`
You are trying to create a primary DOS partition, but one already exists. If there is space available on your hard disk, you can create an extended MS-DOS partition instead.

`Print Error. Abort, Retry?`
This message appears for a number of reasons. Your printer may be turned off or it may not be selected. You may be out of paper. Check your printer and the paper, and retry by pressing **R**. If you are still unsuccessful, your printer may not be working. Press **A** to abort the print command.

`PRINT queue is empty`
There are no files waiting to be printed.

`PRINT queue is full`
There are 10 files in the list of files waiting to be printed, and you attempted to add another file to the queue. You can make room for more by using the PRINT /Q switch. The limit is 32 files.

`Printer error`
Your printer was off line, disconnected, or turned off when you gave the command to change its setting. Restore communication with the printer, then repeat the command. Also, MODE displays this message if you try to set the line width and lines per inch for a printer device that does not have hardware installed.

PRINTER NOT READY!

Your printer is either off or off line. Connect your printer (or make sure it is on line) and repeat the command.

Probable non-DOS disk
Continue (Y/N)?

The disk you are using is not recognized by this version of MS-DOS. The disk was either created by another system with a format that is not supported on this version of MS-DOS, or it is not an MS-DOS disk. Do not continue processing if CHKDSK returns this message for a diskette. If this message returns for a hard disk, the information describing the characteristics of the disk to MS-DOS has been destroyed. In this case, you may continue CHKDSK processing by pressing **Y** (for Yes). This error may mean that the File Allocation Table (FAT) is bad and that the disk is unusable.

Processing cannot continue

There is not enough memory in your machine to process CHKDSK for this diskette. You must obtain more memory to run CHKDSK.

Program size or number of segments exceeds capacity of linker

The total size may not exceed 384KB and the number of segments may not exceed 255.

Program too big to fit in memory

You must acquire more memory to run your application. It is possible that some applications you have run are still using some memory. You may try to restart MS-DOS; however, if you still receive this message, you must acquire more memory.

Read error, COUNTRY.SYS

MS-DOS cannot read the COUNTRY.SYS file. Retry the command. If you get the same message, the COUNTRY.SYS file is probably corrupted. Replace the file from your backup MS-DOS startup diskette.

Read error in *filename*

MS-DOS could not read the entire file.

`Read error, KEYBOARD.SYS`

MS-DOS cannot read the KEYBOARD.SYS file. Retry the command. If you get the same message, the KEYBOARD.SYS file is probably corrupted. Replace the file from your backup MS-DOS startup diskette.

`Read fault error reading drive d:`

MS-DOS is unable to read data from the device (usually a disk drive). Check to see that the disk is properly inserted in the drive, then press **R** (for Retry).

`Requested logical drive size exceeds the maximum available space`

You are trying to create a logical drive that is larger than the space available.

`Requested partition size exceeds the maximum space available.`

You are trying to create a partition on your hard disk that is larger than the available space.

`Requested Screen Shift out of range`

You cannot shift the display any farther.

`Requested stack size exceeds 64K`

Specify a size less than or equal to 64KB with the /STACK switch.

`Restore file sequence error`

You have restored files in the wrong order. You must insert the backup disks in the same order that they were backed up.

`Resynch failed. Files are too different`

FC displays this message if the number of lines in the internal line buffer is less than the number of consecutive, differing lines. If you want to display all of the differences in the file, specify the /LB switch with a larger number of lines.

`Same drive specified more than once`

You tried to activate FASTOPEN for the same drive more than once. You do not need to reactivate it.

`SECOND diskette bad or incompatible`
Either the second disk does not have the same format as the first disk, or DISKCOMP does not recognize the format. Run CHKDSK to help identify the problem.

`Sector not found error reading drive d:`
This error usually means the disk has a defective spot so that MS-DOS cannot find the requested information on it. You should copy all files from the disk onto another diskette and then try to reformat the defective disk.

`Sector not found error writing drive d:`
This error usually means the disk has a defective spot so that MS-DOS cannot write the requested information on it. You should copy all files from the disk onto another diskette and then try to reformat the defective disk.

`Sector size too large in file filename`
The specified device driver (*filename*) loaded by CONFIG.SYS uses a sector size larger than that of any other device driver on the system. You cannot install this device driver.

`Seek error reading drive d:`
MS-DOS is unable to locate the information on the disk. Make sure that the disk is properly inserted in the drive, or try a different drive.

`Seek error writing drive d:`
MS-DOS is unable to locate the information on the disk. Make sure that the disk is properly inserted in the drive, or try a different drive.

`Segment size exceeds 64K`
The addressing system limit is 64KB.

`Share already installed`
You attempted to install SHARE more than once.

`Sharing violation reading drive d:`
A program tried to access a file that another program was currently using. Press **A** (for Abort), or wait awhile and press **R** (for Retry).

`SORT: Insufficient disk space`
The disk is full.

`SORT: Insufficient memory`
There is not enough memory to run the SORT program.

`Source and target drives are the same`
You cannot specify the same drive for both the source and target disks.

`Source does not contain backup files`
You are attempting to restore files from a disk that does not contain backup files.

`Source path required`
You did not specify a source path for REPLACE.

`Specified drive does not exist, or is non-removable`
You must specify the name of a valid diskette drive. DISKCOMP cannot compare hard disks.

`Specified MS-DOS search directory bad`
The SHELL command in the CONFIG.SYS file is incorrect. Make sure that the COMMAND.COM file exists and is in a location specified by the PATH command.

`Symbol defined more than once`
LINK found two or more modules that define a single symbol name.

`Symbol table capacity exceeded`
Very many and/or very long names were typed, exceeding the limit of approximately 25KB.

`Syntax error`
You have entered a command incorrectly. Check to make sure you have typed the command correctly. Remember to enclose the FIND command string in double quotation marks.

`Target cannot be used for backup`

Either the target disk has an unrecognizable format, or it is bad. Try to format the disk with the FORMAT command, or run CHKDSK on it to determine the problem, or use another diskette.

`Target disk may be unusable`

DISKCOPY did not complete the copy operation because of an error. The new disk may have bad data. Try to format the disk with the FORMAT command, or run CHKDSK on it to determine the problem.

`Target diskette is write protected`

The target diskette either has a write-protect tab on it, or it does not have a write-protect notch (5¼-inch diskettes). To use the diskette, remove the write-protect tab and give the command again. If the diskette does not have a write-protect notch, you cannot use it as a target diskette. If the target diskette is a 3½-inch diskette, the write-protect switch is set.

`Target diskette may be unusable`

Either the target disk has an unrecognizable format, or it is bad. Try to format the disk with the FORMAT command, or run CHKDSK on it to determine the problem.

`Target is full`

There is no more room on the target disk for restored files. You must delete some of the files on the disk to make room for these files, or use another disk.

`The last file was not restored`

There was not enough room on the target disk for the file, or the last file was bad. Use the CHKDSK command to determine the problem.

`The only bootable partition on drive 1 is already marked active`

You are trying to change the active partition. The active partition must reside on the first hard disk drive on your system and must be bootable. The only bootable partition on the first hard disk drive is already the active partition.

`Too Many Directories - Aborting`
XTREE found more than its limit of directories on the disk. The program automatically aborts under these circumstances.

`Too Many Directories - Extra Ignored`
During a Log disk operation, XTREE reached its directory limit, which is approximately 180. The program does not log in any more directories.

`Too many drive entries`
You can use FASTOPEN with up to four hard drives. You have tried to specify a fifth drive.

`Too many external symbols in one module`
The limit is 256 external symbols per module.

`Too Many Files - Aborting`
XTREE found more than its limit of files on the disk. The program automatically aborts under these circumstances.

`Too Many Files - Extra Ignored`
During a Log disk operation, XTREE reached its file limit, which is approximately 2800. The program does not log in any more files.

`Too many files open`
MS-DOS could not open the file to edit, or the .BAK file, due to lack of available file handles. Increase the value in the FILES command in your CONFIG.SYS file.

`Too many groups`
The limit is 10 groups.

`Too many libraries specified`
The limit is 8 libraries.

`Too many name entries`
The total number of entries specified for a drive exceeded the maximum of 999.

`Too many public symbols`
The limit is 1024 public symbols.

`Too many segments or classes`
The limit is 256 segments and classes combined.

`Track Ø bad-diskette unusable`
FORMAT can accommodate defective sectors on the diskette except for those near the beginning. Use another diskette.

`Unable to create a directory`
MS-DOS could not create the directory you specified. Check to see that there is not a name conflict; you may have a file by the same name. Also check if the diskette is full.

`Unable to create KEYB table in resident memory`
MS-DOS tried to create a country-specific table for the keyboard code specified, but failed. Check the amount of available memory. There may not be enough memory available to create this table.

`Unable to erase`
BACKUP could not erase the files on the target disk. Check to see that the files on the backup disk are not read-only, and that the disk is not write-protected.

`Unable to Make Directory`
There are three possible reasons why a directory can't be created: a file of the same name already exists in the parent directory, a directory of the same name already exists, or the disk or directory has reached its capacity.

If the problem is name similarity, use a different name. If the disk is full, delete files and then make a new directory. If the directory is full, either delete files or create the new directory from a different parent directory.

`Unable to shift Screen`
MODE is unable to shift the test pattern on the screen any farther.

`Unexpected DOS Error n`
An unexpected error *n* occurred, where *n* is the MS-DOS error number.

`Unrecognized command in CONFIG.SYS`
There is an invalid statement in your CONFIG.SYS file. Correct the file and restart MS-DOS.

`Unrecognized printer`
You are using an invalid printer. Check to see whether you entered the command properly, or see the PRINT command in Chapter 4 to make sure you have specified a valid printer name.

`Unrecognized printer port`
The printer device name you specified was invalid. You may need to set the printer port with the MODE command.

`Unrecoverable error in directory`
`Convert directory to file (Y/N)?`
If you press **Y** in response to this prompt, CHKDSK converts the bad directory into a file. You can then fix the directory yourself or delete it. If you press **N** in response to the prompt, you may not be able to read from or write to the bad directory.

`Unrecoverable read error on drive` *`d`*`:`
When the specified drive was read, a read error occurred that the program couldn't overcome. The disk may contain flawed sectors. Although DISKCOMP continues to compare the remaining tracks, you won't know if there are differences in the unreadable areas. Use CHKDSK or RECOVER to try saving the disk.

`Unrecoverable write error on drive` *`d`*`:`
When the specified drive was written to, an error occurred that the program couldn't overcome. The disk may contain flawed sectors. Although DISKCOMP continues to compare the remaining tracks, you won't know if there are differences in the unwritable areas. Use CHKDSK or RECOVER to try saving the disk.

`Unresolved externals:` *`list`*
The external symbols listed have no defining module among the modules or library files specified.

`usage: fc [/a] [/b] [/c] [/l] [/lb n] [/w] [t] [/n] [/NNNN] file1 file2`

One of the switches you have specified in the FC command is invalid.

nnn `version of Graphic Character Set Table is already loaded`

You tried to load the Graphic Character Set Table with the GRAFTABL command when it already exists in memory.

`VM read error`

This is a disk error; it is not caused by LINK.

`Warning-directory full`

The root directory is too full for RECOVER processing. Delete some files in the root directory to free enough space for RECOVER to run.

`Warning! Diskette is out of sequence`
`Replace diskette or continue if okay`
`Strike any key when ready`

You should restore the diskettes in the order that you backed them up.

`Warning! File` *filename* `was changed after it was backed up`
`Replace the file (Y/N)?`

This message asks you if you want to replace a backup file that has been changed. Press **Y** (for Yes) to restore this file, or press **N** (for No) to skip the file.

`Warning! Files in the target drive \backup (or root) directory will be erased`

BACKUP found files in the target drive, and you did not specify the /A switch to append files.

`Warning! No files were found to back up`

BACKUP did not find any files to back up on the disk you specified.

`Warning! No files were found to restore`

RESTORE did not find the file or files you specified to restore from the backup disk.

`Warning: no STACK segment`

None of the object modules specified contains a segment initializing stack space. This is not a problem if you are creating a .COM file. EXE2BIN initializes the stack to the top of the program prefix segment.

`Warning: Read error in EXE file`

The amount read was less than the size of the header. This is a warning message only.

`Warning: segment of absolute or unknown type`

There is a bad object module, or you tried to link modules that LINK cannot handle (such as an absolute object module).

`Warning! The partition marked active is not bootable`

The active DOS partition must be bootable.

`Write error in TMP file`

No more disk space remains to expand the VM.TMP file.

`Write error on run file`

Usually, there is not enough disk space for the Run file.

`Write fault error writing drive d:`

MS-DOS is unable to write data to the specified device. Check that the disk is properly inserted in the disk drive. Then press **R** (for Retry). If the error occurs again, press **A** (for Abort).

`Write protect error writing drive d:`

You tried to write data on a write-protected disk. If the disk has a write-protect tab on it (5¼-inch diskettes) or the write-protect switch is set (3½-inch diskettes), you must remove the protection before you can write on the disk. (You should consider first why the disk was write-protected.) If the disk doesn't have a write-protect notch, you cannot write on that disk.

Appendix C

International Keyboard Layouts

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Italy C-5
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Switzerland C-9
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Generating Special Characters C-11

Entering Characters Using Alt Gr C-12

Introduction

MS-DOS includes commands that allow you to select international keyboard layouts for your U.S. keyboard.

After loading an international keyboard command, you can use your United States keyboard to generate most of the corresponding international characters. See the KEYB command in Chapter 4 for details on the correct use of these commands to change the keyboard layout.

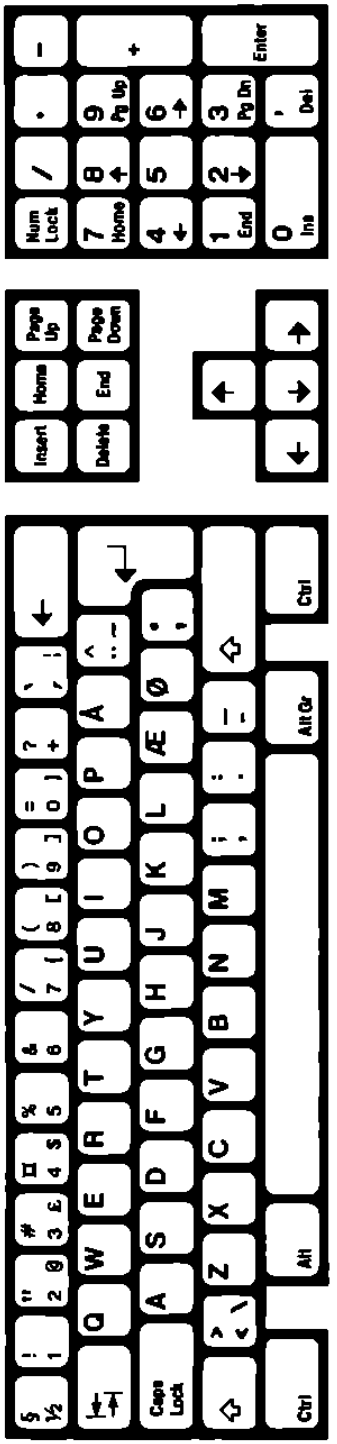
The layouts for the individual international keyboards are illustrated on the following pages. Use these illustrations to locate equivalent keys on your U.S. keyboard.

To reload the United States keyboard layout after using another one, press **Ctrl Alt F1**. To reselect the international keyboard layout you were using, press **Ctrl Alt F2**.

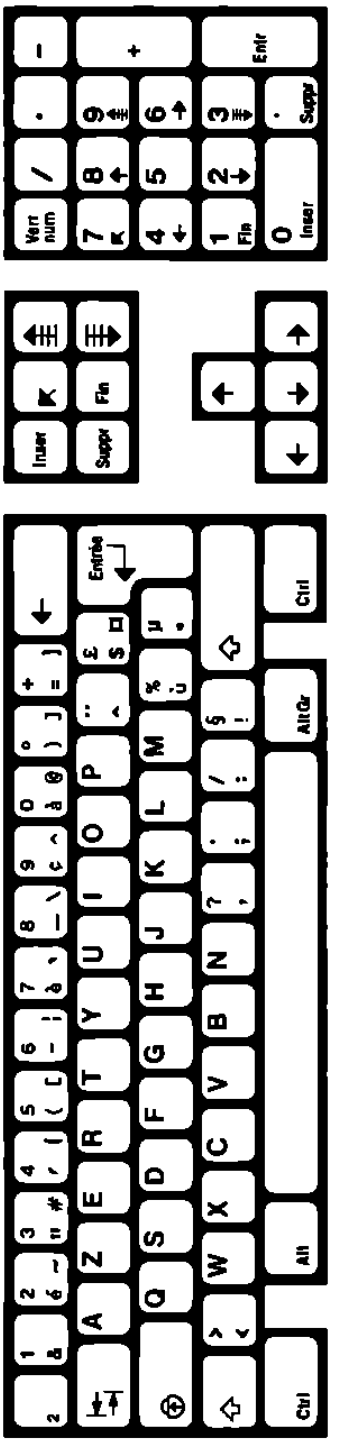
Belgium

Canada

Denmark



France



Germany

Italy

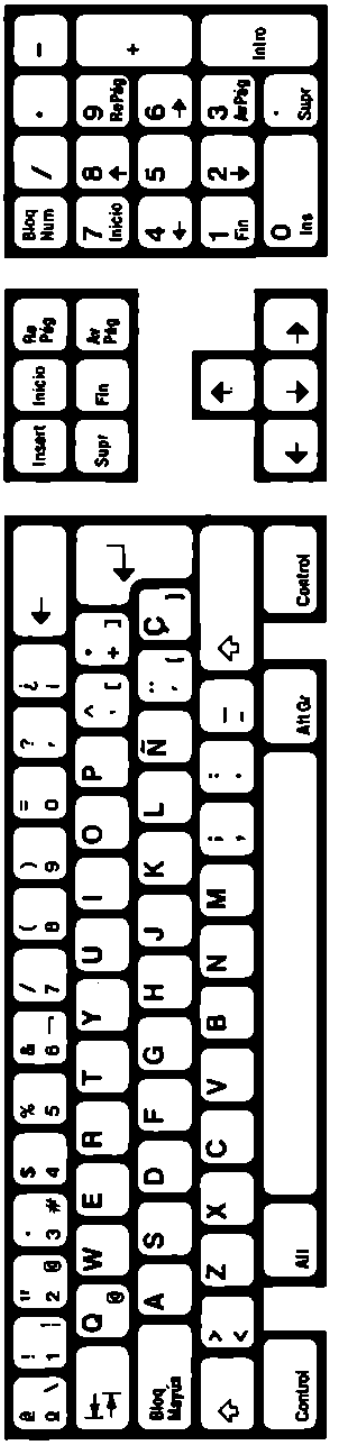
Latin America

Netherlands

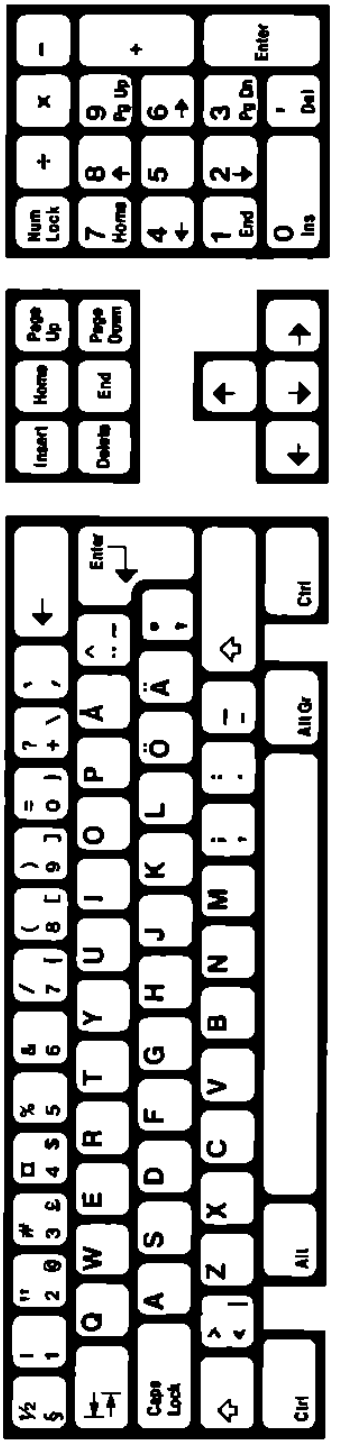
Norway

Portugal

Spain



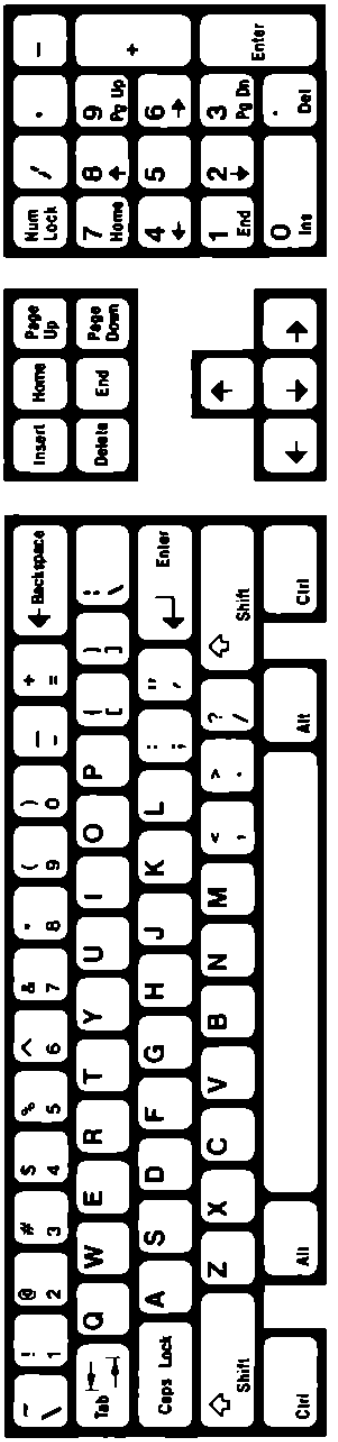
Sweden/Finland



Switzerland

United Kingdom

United States



Generating Special Characters

With some of the international keyboards, you can generate special characters with accents or other special marks above or below certain letters. To produce the characters in the following lists first press the key for the special mark; then press the letter key. After you press the letter key, the letter with the special mark appears on your screen.

For example, after you use the KEYB command to select the French keyboard, if you press the ^ key and then **a**, the character **â** appears on your screen.

There are no special character sequences for the United Kingdom keyboard or the Italian keyboard.

Note
These sequences are sometimes called dead key combinations.

Use this method to produce the following special characters:

Germany
áéÉíóú àèìòù

France
äÄëïöÖüÜÿ âéîôû

Spain
äÄëïöÖüÜÿ áéÉíóú àèìòù âêîôû

Belgium
âêûîô äëüïöÿÄÜÖ áéúíóÉ àèùìò ñÑ

Denmark
éÉáíóú àèìòù âêîôû äÄëïöÖüÜÿ

Norway
éÉáíóú àèìòù âêîôû äÄëïöÖüÜÿ

Portugal
áÁéÉíÍóÓúÚ ãÃõÕñÑüÜ àÀèÈìÌòÒùÙ âÂêÊôÔ

Swiss (French)

ñÑ âêîôû àèìòù äëïöüÄËÏÖÜÿ éÉáíóú

Swiss (German)

ñÑ âêîôû äëïöüÄËÏÖÜÿ éÉáíóú

Sweden

éÉáíóú àèìòù äÄëïöÖüÜÿ ñÑ

Finland

éÉáíóú àèìòù äÄëïöÖüÜÿ ñÑ

Canada

éÉíí àÀèÈùÙ âÂêÊîÎôÔûÛ äÄëËïÏöÖüÜ çÇ

Entering Characters Using Alt Gr

Certain keys on the international keyboards are marked with one or two extra characters. See the illustrations on pages C-3 through C-9 for the location of these keys. You can produce the extra characters by pressing the **Alt Gr** key (the **Alt** key located on the right of the space bar) with the selected character key when you are using a foreign keyboard command.

For example, to input the @ character on a French keyboard, press **Alt Gr** and **0**.

Appendix D

Code Page Tables

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Introduction

The tables in this appendix list the code pages used by MS-DOS. Code page switching is described in Chapter 9.

By using the tables you can determine the hexadecimal value of each character. The first hex digits are in the top row, and the second hex digits are in the first column.

Code page 437 (United States—English)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		☺	☻	♥	♦	♣	♠	•	◘	○	◙	♂	♀	♪	♫	☼
1	▲	▼	↕	!!	¶	§	▬	↨	↑	↓	→	←	∟	↔	▲	▶
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	Pt	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬	½	¼	¡	«	»
B	▒	▓	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
C	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	▒	▒	▒	▒	▒
E	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	°	∙	·	√	ⁿ	²	■	

Code page 850 (Multilingual)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		☺	☻	♥	♦	♣	♠	•	◘	○	◙	♂	♀	♪	♫	☼
1	▲	▼	↕	‼	¶	§	▌	↨	↑	↓	→	←	∟	↔	▲	▶
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
B	▒	▓	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
C	└	┴	┬	├	─	┼	ã	Ã	╚	╔	╩	╦	╠	═	╬	¤
D	ð	Ð	Ê	Ë	È	ı	Í	Î	Ï	┘	┌	█	▌	▐	▀	▄
E	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	¯	´
F		±	‗	¾	¶	§	÷	¸	°	¨	•	¹	³	²	■	

Code page 860 (Portuguese)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		☺	☻	♥	♦	♣	♠	•	◘	○	◙	♂	♀	♪	♫	☼
1	▲	▼	↕	‼	¶	§	▬	↨	←	→	↑	↓	∟	↔	◄	►
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8	Ç	ü	é	â	ã	à	Á	ç	ê	Ê	è	Ì	Ô	ì	Ã	Â
9	É	À	È	ô	õ	ò	Ú	ù	Ì	Õ	Ü	¢	£	Ù	Pt	Ó
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	Ò	¬	½	¼	¡	«	»
B	▒	▓	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
C	└	┤	├	┴	┬	┤	┼	├	┴	┬	├	╢	╖	╕	╣	╝
D	┴	┬	├	┤	┴	┬	├	┼	┴	┬	┤	╜	╛	┐	┘	┌
E	α	β	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	°	•	·	√	ⁿ	²	■	

Code page 863 (Canada—French)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		☺	●	►	◆	♣	♠	•	◘	○	■	♂	♀	♪	♫	☼
1	▲	▼	↕	!!	¶	§	▌	↨	←	→	↑	↓	⌟	↔	◄	►
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8	Ç	ü	é	â	À	à	¶	ç	ê	ë	è	ï	î	▬	À	§
9	É	È	Ê	ô	Ë	Ï	û	ù	¤	Ô	Ü	¢	£	Ù	Û	ƒ
A	´	`	ó	ú	¨	¸	³	¯	¯	⌐	¬	½	¼	¾	«	»
B	▒	▒	▒	—	┤	╣	╦	╗	┐	╝	═	┌	┐	┘	┘	└
C	┘	┤	├	┴	┼	╞	╩	╚	┴	╔	╠	╟	╟	‖	╬	╠
D					╦	╩	╦	╬	╬	┬	└	▌	▐	▄	▬	▌
E	α	β	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	■	±	≥	≤	⌠	⌡	÷	≈	°	•	·̈	√	ⁿ	²	■	

Code page 865 (Nordic—Norwegian and Danish)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		☺	☻	♥	♦	♣	♠	•	◘	○	◙	♂	♀	♪	♫	☼
1	▲	▼	↕	‼	¶	§	▌	↨	↑	↓	→	←	∟	↔	▲	▶
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	Pt	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬	½	¼	¡	«	¤
B	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▄	▌	▐	▀
E	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	°	∙	·	√	ⁿ	²	■	

Appendix E

ANSI Escape Sequences

Introduction E-2

Cursor Functions E-2

Modes of Operation E-4

Keyboard Reassignment E-6
Examples E-7

Introduction

This appendix explains how the ANSI escape sequences are defined for MS-DOS. This appendix also includes examples of how to use ANSI escape sequences.

An ANSI escape sequence is a series of characters (beginning with an escape character or keystroke) that you can use to define functions for MS-DOS. Specifically, you can reassign keys, change graphics functions, and affect cursor movement.

The following conventions apply to the ANSI escape sequences described here:

- The default value is used when you do not specify an explicit value or a value of zero.
- Pn represents a numeric parameter. This is a decimal number specified with ASCII digits. Do not type the P.
- Ps represents a selective parameter. This is any decimal number that identifies a subfunction. You may select multiple subfunctions by separating the parameters with semicolons. Do not type the P.
- Be sure to include the bracket because it is a necessary part of the escape sequence.

Cursor Functions

Table E-1 lists the escape sequences that affect the cursor position on the screen.

Table E-1. Cursor functions

Name/Format	Description
Cursor Position (CUP) **Esc [Pn;PnH** Horizontal and Vertical Position (HVP) **Esc [Pn;Pnf**	CUP and HVP move the cursor to the position specified by the parameters. The first parameter specifies the line number, and the second parameter specifies the column number. All default values are 1. When you do not specify the parameters, the cursor moves to the home position.
Cursor Up (CUU) **Esc [PnA**	This sequence moves the cursor up one line without changing columns. The value of Pn determines the number of lines to move. The default value for Pn is 1. There is no effect if the cursor is already on the top line.
Cursor Down (CUD) **Esc [PnB**	This sequence moves the cursor down one line without changing columns. The value of Pn determines the number of lines to move. The default value for Pn is 1. There is no effect if the cursor is already on the bottom line.
Cursor Forward (CUF) **Esc [PnC**	This sequence moves the cursor forward one column without changing lines. The value of Pn determines the number of columns to move. The default value for Pn is 1. There is no effect if the cursor is already in the far right column.
Cursor Backward (CUB) **Esc [PnD**	This sequence moves the cursor back one column without changing lines. The value of Pn determines the number of columns to move. The default value for Pn is 1. There is no effect if the cursor is already in the far left column.
Device Status Report (DSR) **Esc [6n**	The console driver outputs a CPR sequence (see below) on receipt of the DSR escape sequence.
Cursor Position Report (CPR) **Esc [Pn;PnR** (from console driver to system)	This sequence reports current cursor position via standard input. The first parameter specifies the current line and the second parameter specifies the current column.

Table E-1. Cursor functions (continued)

Name/Format	Description
Save Cursor Position (SCP) **Esc [s**	This sequence saves the current cursor position. The RCP sequence (see below) restores this cursor position.
Restore Cursor Position (RCP) **Esc [u**	This sequence restores the cursor position to the value it had when the console driver received the SCP sequence.
Erase Display (ED) **Esc [2J**	This sequence erases the screen, and the cursor goes to the home position.
Erase Line (EL) **Esc [K**	This sequence erases from the cursor to the end of the line (including the cursor position).

Modes of Operation

Table E-2 lists the escape sequences that affect screen graphics.

Table E-2. Screen graphics

Name/Format	Description
Set Graphics Rendition (SGR) **Esc [Ps;...;Psm**	This sequence invokes the graphic functions specified by the SGR parameters described in Table E-3. The graphic functions remain in effect until the next occurrence of an SGR escape sequence.
Set Mode (SM) **Esc [=Psh** **Esc [=h** **Esc [=Øh** **Esc [?7h**	This sequence changes the screen width or type. See Table E-4.
Reset Mode (RM) **Esc [=Ps1** **Esc [=1** **Esc [=Ø1** **Esc [?71**	Parameters for RM are the same as for SM, except that parameter 7 resets the wrap at the end of line mode. See Table E-4.

Table E-3 describes the parameters and functions for the Set Graphics Rendition (SGR) escape sequences. Your display adapter may not support all these functions.

Table E-3. SGR parameters

Parameter	Function
0	All attributes off
1	Bold on
2	Faint on
3	Italic on
4	Underscore on (monochrome displays only)
5	Blink on
6	Rapid blink on
7	Reverse video on
8	Concealed on (ISO 6429 standard)
30	Black foreground (ISO 6429 standard)
31	Red foreground (ISO 6429 standard)
32	Green foreground (ISO 6429 standard)
33	Yellow foreground (ISO 6429 standard)
34	Blue foreground (ISO 6429 standard)
35	Magenta foreground (ISO 6429 standard)
36	Cyan foreground (ISO 6429 standard)
37	White foreground (ISO 6429 standard)
40	Black background (ISO 6429 standard)
41	Red background (ISO 6429 standard)
42	Green background (ISO 6429 standard)
43	Yellow background (ISO 6429 standard)
44	Blue background (ISO 6429 standard)
45	Magenta background (ISO 6429 standard)
46	Cyan background (ISO 6429 standard)
47	White background (ISO 6429 standard)
48	Subscript
49	Superscript

Table E-4 lists the parameters and functions for the Set Mode (SM) and Reset Mode (RM) escape sequences.

Table E-4. SM and RM parameters

Parameter	Function
0	40 x 25 black and white
1	40 x 25 color
3	80 x 25 black and white
4	320 x 200 color
5	320 x 200 black and white
6	640 x 200 black and white
7	Wrap at end of line

Keyboard Reassignment

Although not part of the ANSI 3.64-1979 or ISO 6429 standard, the following keyboard reassignments are compatible with these standards.

The control sequence is one of the following:

- **Esc** `[Pn;Pn;...Pnp`
- **Esc** `["`*`string`*`";p`
- **Esc** `[Pn;"`*`string`*`";Pn;Pn;"`*`string`*`";Pnp`
- any other combination of strings and decimal numbers.

The final code in the control sequence (p) is one reserved for private use by the ANSI 3.64-1979 standard.

The first ASCII code in the control sequence defines which code is mapped. The remaining numbers define the sequence of ASCII code to generate when this key is intercepted. Note that there is one exception: if the first code in the sequence is zero (NUL), then the first and second codes make up an extended ASCII redefinition.

Examples

To reassign the Q and q key to the A and a key (and vice versa), use the control sequence:

Esc [65;81P	A becomes Q
Esc [97;113p	a becomes q
Esc [81;65p	Q becomes A
Esc [113;97p	q becomes a

To reassign the **F10** key to a DIR command followed by a carriage return, use the control sequence:

Esc [Ø;68;"dir";13p

The 0;68 is the extended ASCII code for the **F10** key; 13 decimal is a carriage return.

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